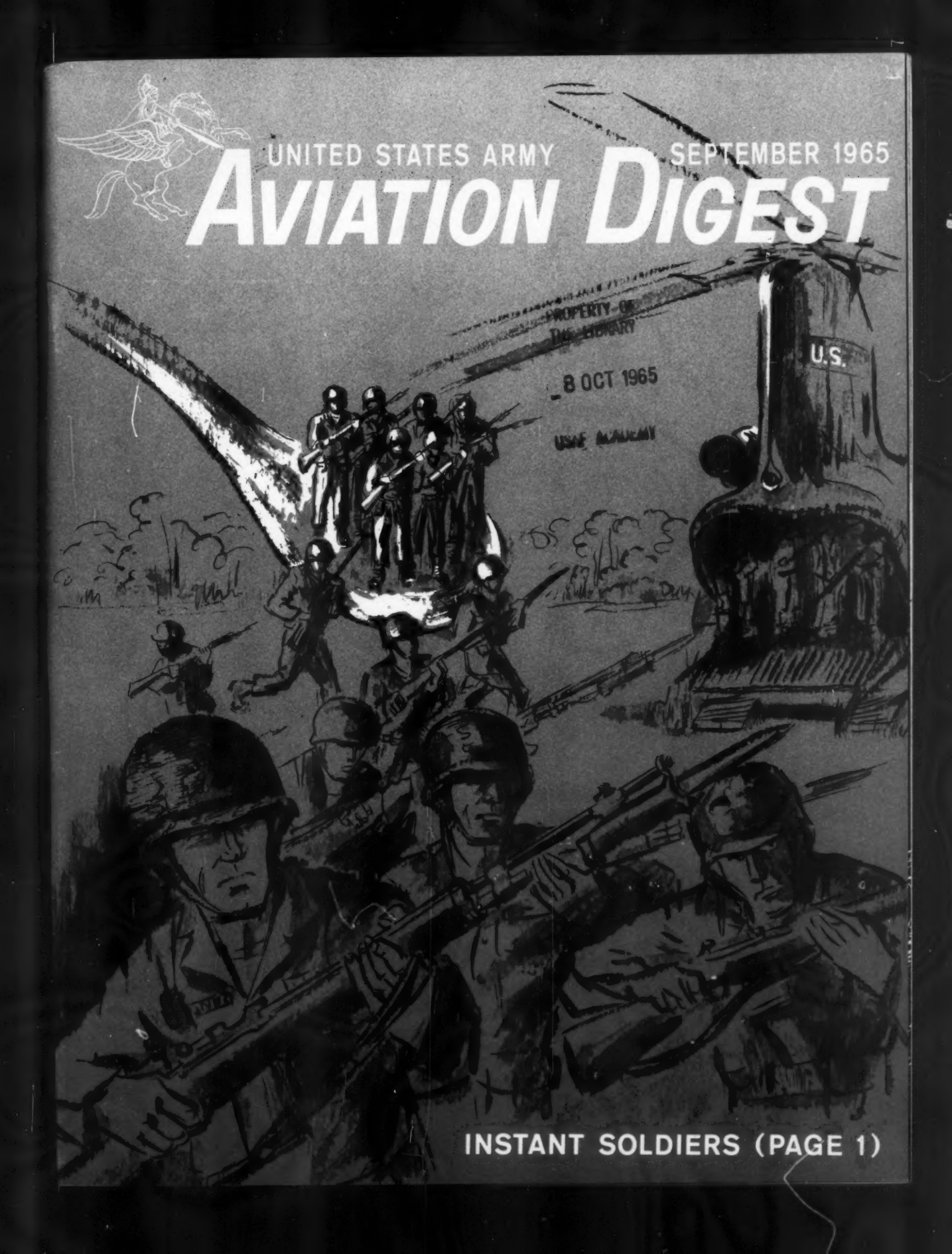
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SEPTEMBER 1965
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U.S.
INSTANT SOLDIERS (PAGE 1)

UNITED STATES ARMY AVIATION DIGEST

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The mission of the U. S. ARMY AVIATION DIGEST is to provide information of an operational or functional nature concerning safety and aircraft accident prevention, training, maintenance, operations, research and development, aviation medicine, and other related data.

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Instant Soldiers . . .

Major Milton P. Cherne

THE GENERAL tried to rub the sleep out of his eyes and scratched at a 2-day stubble of beard matted with the grime and dirt of battle. His bones ached from weariness and he found it difficult to concentrate on the activities that were to take place in just a few hours.

Up to now, the plan had been a smashing success and his division had moved over 80 miles

practically unopposed. The last 5 had been on foot, but the corps commander did not want to let the attack bog down until after a bridgehead across the Mesda River had been established. Now, after 2 days of exploitation, they were preparing to make a river crossing assault in less than 3 hours.

When the action began 2 days ago, the plan was to feint an attack on the left flank of the enemy's VI Army. However, after the initial assault by U. S. Forces, an armored division plunged through the hole made by the infantry and quickly secured a limited objective 25 miles to the north. The entire operation was conducted with such startling ease that the general's infantry division was immediately committed from reserve. He was ordered to pass through the armored division, maintain contact with the enemy and secure a river crossing on the Mesda River in hopes of encircling the entire left flank.

A chill ran down the general's spine. He wasn't certain whether it was from exposure to the continuous drizzle that had slowly and almost deliberately soaked him to the skin, or whether it was a feeling of foreboding that all seasoned combat veterans sense when the jigsaw of conflict fails to fall into a pattern. He had experienced this same uneasiness in previous situations: once before jumping into Holland in WW II; again at the Yalu in Korea; once more in a small, unnamed nondescript village in Vietnam; and now, the feeling was stronger than ever.

Nothing seemed to add up! Why was the penetration so seemingly effortless? Although fighting had been intense for a short time, the enemy didn't attempt to employ his reserves, to plug the gap, or to counterattack the flanks of our assaulting unit before the shoulder of the breakthrough could be rolled back and held. The enemy's delaying actions had been deliberate, and brilliantly executed.

When the enemy wanted to break contact with our forward elements or main body, he just seemed to vanish into thin air, only to be encountered again at the time and place of his choosing. Although our exploitation had progressed with seemingly little resistance, each delay, each deployment, and each attack against his positions had taken its toll. With each attack against a delaying position we found only the dead, wounded, empty foxholes, and a shower of incoming enemy artillery fire—brief, but effective.

Wounded aggressors were well fed and clothed, and their morale was high; "contemptuous" and "arrogant" better describes them. They were not the kind of soldiers you would expect to overrun in a retreating, panicking force—a force that was being thoroughly beaten and didn't have the brains to know it. That young, wounded enemy platoon leader still had a shine on his jump boots when we overran his position. Nothing added up—the jigsaw wouldn't fall into place.

"General," the G-2 shouted as he interrupted the thoughts of his CO, "I don't believe in ghosts, but these guys we're fighting are acting like a bunch of 'spooks.' Since our attack started, we have positively identified personnel from three different divisions."

"What's so unusual about that?" retorted the general. "It isn't unusual to grab anyone that's available including cooks and bakers when the going gets rough."

The general knew that he was wrong. He clearly understood that

he was not fighting cooks and bakers, but a first-class combat force.

"But general, I have pay records, letters, privilege cards, and other proof that some of their troops were billeted in major cities more than a thousand miles from here only yesterday. I'm convinced that some of them left their areas not later than yesterday!"

"Impossible! Utterly and absolutely impossible," cried the CG, half wanting to believe what he was saying. "This stinking weather wouldn't let a helicopter fly, much less large numbers of transport airplanes. Besides, our radar would have picked up any aircraft flying within 50 miles. No, it has to be something that we just haven't grasped yet. Maybe a deliberate plant to force us off our guard and delay our river assault. It's got to be something else! But what?"

A cheerful voice hailing a bright and chipper "Good Morning" spun the G-2 and CG around. Despite the miserable, cold, wet, intolerable hour of the morning, the general had to grin when he saw his hollow-eyed, mud-covered G-3 almost humorously enveloped in an oversized poncho.

"Well," chided the general, "what happy news does Peter Pan have to spread on this inglorious occasion?"

"I think I'm getting punchy—because the news isn't at all cheerful. Permit me to quote from this corps dispatch . . .

" 'Aerial machines of unusual design have been striking the exposed flanks of the division trains in large numbers and with devastating effectiveness. Rappelled or airlanded observers are directing accurate fire on support vehicles. Gasoline in critical supply. Will attempt aerial resupply as soon as weather permits. No change in orders.' "

. . . assault from where? Front? Flank? Rear? How in this terrain and weather could aircraft possibly land?

"Thank you," said the general in a solemn tone. "A short while ago I was thankful for this limited visibility and fog. It should have given us a cover for our river crossing, but it appears to be a curse and not a blessing. Leave me alone for a few minutes to think this thing out. Continue to plan the assault and I'll call you if I have any changes to make."

The general sucked on his unlit pipe as he propped himself against a nearby tree and tried to search his memory for some clue that would put everything into perspective.

• • •

. . . In all these years, with all of my experience and background, there must be something I read, saw, or did that will give me the clue I'm seeking . . . Where? Where? Where?

December 1944: Operation Market Garden—one of airborne warfare's greatest efforts and my first combat experience with *vertical envelopment*. Air columns 35 minutes long blanketed the sky. The enemy saw us coming and took their toll; indeed they did—in the air and on the ground. They established effective area denial systems – without modern air defense equipment. But what *am* I facing? If these . . . *these things* haunting me would just get up to radar altitude I could make our muscles felt.

I remember General Gavin's statement. ". . . armies will never again fight in the close masses characteristic of World War II. . . . surprise is the essence of airborne and antiairborne success, both sides will endeavor to the utmost to attain it. In engagements involving adversaries of comparable means, victory will go to the commander with the best executed plan and cover plan."

I do wish that an old fashioned airborne counterattack were my problem now. I could deal with that, I know.

The Yalu—what an odd name for a river. I'll have to admit that things were quite different in Korea in 1950. We might have turned the tide if we'd had helicopters by the hundreds instead of the handful, and if we'd had transports that could carry 50 to 70 men from CONUS in 20 hours and land on a 100-foot square frozen rice paddy.

What a tremendous capability could be developed with such airships. Think of it—*Instant Soldiers*—able to ride to work from a thousand miles away, open the back door, step out fresh, and get on with the business at hand. What a capability to exploit!

How we used to wheel and deal on these subjects back in 1955 at Fort Leavenworth, Kan. So many officers were obsessed with a thought that everything must be bigger, faster, and vastly more complex. Then a group at Fort Rucker, Ala., was valiantly trying

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INSTANT SOLDIERS

to sell their ideas on Sky Cavalry and vertical envelopment—helicopters with guns and rockets providing their own mobile firepower to support integral infantry elements. What a lot of Mickey Mouse equipment they had in those days. But what they thought and what they did made good sense. They had the same spirit of pioneering that we had back in the early days of airborne warfare.

Let's see! The first time the Army really engaged in combat support assault operations by employing helicopter vertical envelopment techniques was in Vietnam in January 1962. That was the key: shock action, increased mobility, and firepower. Put the troops where you want them, when you want them, and how you want them. Attack from dispersion, concentrate on the objective and disperse just as rapidly. We had them rocking on their heels for a while, but we couldn't exploit our gains as we could against a known and uninformed enemy. It seemed incredible, even then, to be able to mount up the troops a hundred miles away from the objective and in less than an hour have these fresh soldiers debark in battle formation for the assault.

The general peered into the overcast as the zoom of an "invisible," low-flying aircraft destroyed his train of thought. The trees almost swayed with the rapidity of its passing.

• • •

The battle station of the enemy commander was in an obscure-looking farmhouse 40 miles north of U. S. units. His communications were there for effectively controlling his fighting forces. He was controlling the unorthodox. His mind was clear and his thinking flexible. A plotting board, radios, a time distance computer, prior plans and years of study were his primary tools.

The enemy general was in direct contact with the pilot of the aircraft that had interrupted the American general's thoughts. He was receiving automatically relayed radar data concerning U. S. troop locations based on reflections cast by equipment and vehicles. This information was being fed into a computer, and target concentrations (by density of blips) were automatically read out into grid coordinates to the fire control center.

Looking up from a closed circuit TV set, the general directed that the radar reconnaissance plane make another sweep on the 200-400 mile radian. As these instructions were being relayed, he studied his troop location plotting board once again. Fresh troops in dispersed locations were standing by awaiting orders. Mentally pointing to the board, he computed the flying time of Task Force Zebra, which was now 600 miles away. Task Force Romeo was only 400 miles away, and the multitude of other dots ranged from 150 to just over 300 miles.

Another quick check of the intelligence teletype machine verified the impending attack of the main U. S. force. With apparent ease, he ordered Task Force Romeo to reinforce units in contact with the main U. S. elements. In 53 minutes, the prepositioned remote area letdown systems would be activated. The pilots would merely punch the approach coupling button on the autopilot of their VTOL transports and the landing would be completed automatically—a landing that would be made vertically and under any visibility condition. In an hour, all of the U. S. intelligence data that had been so patiently collected and evaluated would be useless. Instead of attacking a unit defending a broad front, they

Think of it . . . Instant Soldiers . . . able to ride to work from a thousand miles away, open the back door, step out fresh and ready to fight. What a capability to exploit!

would march into the mouth of a tiger.

The general paused a moment and chuckled cynically as he compared his situation with that of the Americans. Now I'll show them some real mobility, he thought as he turned to a map depicting the positions of the American division poised to cross the river.

"Fire Control Center," the general commanded, "light and medium artillery and missile fires on radar centroid targets.

"Air Control Center," he called, "VTOL attack craft positioned north to south along the axis of advance of U. S. divisions will commence attack in 3-5 minutes. Attack will be made from west to east."

Upon receipt of these orders, the enemy pilots gave their machines a final check and, although 92 miles west of their plot, they had ample time to devote to last minute planning.

• • •

The American general picked up his map as he called for the G-3 and other members of his staff. "I don't like the looks of what is going on, and I am taking it upon myself to delay the river assault crossing until we can get some air support and have our helicopters resupply us. I want a perimeter defense established along these terrain features I've outlined on the map. Have your men fell as many trees as you can into every open area—no matter how small it is. This may destroy potential landing areas.

"I want all areas that are too large to be spoiled by felled trees covered with all available automatic weapons. Park our vehicles in random fashion in these large areas and hope that they will fill in as hasty obstacles. We haven't enough gas to use them for much of anything else anyway.

"Signal Officer! I want any and all unusued wire strung from treetop to treetop in hopes of tangling whatever kind of machines they have. I want mines, booby traps, and whatever good GI ingenuity we can come up with to play these open areas. Gentlemen, this is our threat. Not the likely avenues of approach. Not the heavy forest that could cover infantry movement. We've got to worry about open areas that will permit access to our location from the air. Are there any questions? Then move out!"

Before the general could finish his order the unforgettable howl of artillery shells whining through the air and crashing into the treetops with shattering explosions filled the air. This was not harassing fire; this was preassault fire. But assault from where? Front? Flank? Rear? How, in this terrain and weather, could aircraft possibly land?

With devastating accuracy the artillery shells continued to bombard the areas containing the greatest number of men and equipment. Slowly the units started to pull back toward the south in an

effort to escape the punishing fires.

As quickly as it started, the fires terminated—only to have the silence broken by the whine of approaching turbines in the still obscured skies. This was followed immediately by the swoosh of missiles homing their way to division's vehicles. The chatter of machinegun firing was unnerving, despite the fact that it was unaimed. In a matter of seconds, all was quiet except for the occasional explosion of a gasoline tank or basic load of vehicle ammunition.

The general stood up just in time to hail a messenger who almost ran past him. "Sir," panted the runner, "we just got this message from corps."

"Thank you, son," replied the general as he unfolded the message. By the first light of morning he strained to make out the context of the message. "Unaccounted enemy reinforcements have contained the main assault. Corps falling back to original lines awaiting support. You will fall back to objective Orange. Air support and resupply available soonest. Expedite.—Thrush."

Grabbing a pad, the general scribbled a note reading: "WILCO, have casualties from artillery bombardment and aerial assault . . . negative contact with enemy . . . closing station, moving out . . . request aircover priority."

"Here, soldier," the general said as he passed the message to the runner; "get this out as quickly as possible."

As rapidly as could be expected under these situations, the now exhausted men reformed their weakened units and prepared to displace to the south. Grudgingly, they gave up ground they had fought to take only a short time ago.

Again the rain and drizzle fell upon them, promising them another day of low ceilings and wet misery. The breaking dawn gave light to the forest and rolling hills, but the serenity of the moment was soon broken by the scream of more artillery shells falling aimlessly in their area. Through the din of these noises could be faintly heard the unmistakable whine of aircraft engines. This time they did not pass by at high speeds, but increased in volume as they were accelerated to high rpm in terminal approach. To the north, to the south, west and east could be heard this blood-

curdling sound. This was not a small attack machine, these were multiengined craft unloading hordes of troops in complete encirclement of the ragged division.

Small arms fire broke out almost immediately, followed by light, rapid-fire artillery. Beetle-shaped, antimachinegun armored cars were observed careening into position before bringing their intense fire on our hastily dug-in troops.

Reaching for his pad again, the general scratched out another message. "Contact established with enemy . . . we are surrounded and unable to break out . . . request armored linkup immediately . . . request air support soonest . . . situation desperate." Loosening his own pistol in its holster, he anxiously awaited a reply to his requests.

A stray round ricocheting off a nearby tree caused him to instinctively duck. However, the clicking of the radio soon commanded his attention, and he momentarily ignored his environment.

"Armored Division already moving north. Opposition light to moderate. Expect linkup 1200 hours soonest. Forecast weather to lift 1500 hours. Air priority to your unit. Request your status."

Again the general handed the radio operator a message. "Under heavy attack all flanks. Enemy unconfirmed. Estimate two divisions. We will make our stand here.—Custer, CG."

Shortly after 1100 hours the scout elements of the armored division cautiously moved through the battle-scarred terrain. The silence was deafening. Occasionally a cry arose from a wounded man, but nowhere was there a live, dead, or wounded enemy. Silence and a void was all that greeted them. The enemy had vanished! Task Force Zebra had come—and was *gone!*

"Tom—Tom Custer, will you wake up! You're working too hard again. I wish you'd finish that paper you're working on and take a little vacation. You've just been working too hard and when you go off like this, I really do worry about you," chided his concerned wife.

"Sweetheart, I wasn't fighting Holland, nor Korea, nor Vietnam. I was really fighting our official position on that 'paper' you mentioned that I'm working so hard on. It's been a real tough one all right, but I just made up my mind. *We cannot afford less!*"

When you speak say what you mean in clear language

Mumbo Jumbo

William H. Smith

FOR HUNDREDS of years many brilliant and devoted men have worked to reform and clarify our language so that we can all understand each other. Everyone who has graduated from school has had years of English courses designed to help him communicate effectively.

Yet many professional or semi-professional men seem to forget their early English training and develop a language of "mumbo jumbo" seemingly designed only to confuse and impress the layman.

This tragedy of modern communications failure is illustrated by a story of the famous author, Stuart Chase[1]. Mr. Chase says that a plumber wrote to one of the government agencies in Washington to ask if it is safe to use hydrochloric acid to clean out clogged drains.

The agency wrote back, "The efficacy of hydrochloric acid is indisputable, but the chlorine residue is incompatible with metallic permanence."

The plumber wrote back to thank the agency and said he was glad it was all right to use the acid. He promptly received another letter saying the government "could not assume the responsibility for the production of toxic noxious residues of hydrochloride" and suggested he use an alternate procedure. The plumber again wrote to thank the agency and said he was glad they still thought it was all right for him to use the acid.

By return mail he got a letter saying in unmistakable terms, "Don't use hydrochloride; it eats hell out of pipes."

Keeping company with the professionals who have forgotten plain English are many Army Aviation people. They have fallen into the rut of vague, ambiguous technical jargon which is sometimes annoying and can be downright dangerous. When aviators talk among themselves about their work, aeronautical jargon is likely to creep into the discussion. There's no objection to this, but when these terms spill over into conversation with nonflying personnel, there is danger of a misunderstanding that could jeopardize a mission.

A good example of this occurred last winter. A division was planning to move some troops by supporting transport aircraft. Staff officers had assembled to make final plans. They were worried because the weather had been damp and overcast for the last few days. The division aviation officer got up and said that for the flight it would be "thick stratus all the way."

To his amazement, the other officers immediately started making plans to move the troops by

land. They had understood the aviation officer to say that the weather was very bad; therefore, they didn't want to chance going by air.

Of course, the aviation officer quickly explained that he meant it would be good instrument flying all the way with no thunderstorms.

In another case an aviator on ground duty burst into his battalion commander's office and reported that one of the division fliers had "bought the farm."[2]

The CO looked up, his mind still on the paper he was reading, and said, "That's fine. Real estate is a good investment."

The Army spends much money and time training its men to deliver clear and precise orders. In the field and in combat there is seldom time for an officer or NCO to explain in detail what is meant when they give an order or pass a message. When an aviator lapses into fancy words to make his flying seem interesting and glamorous, he loses the ability to make himself understood. Even when the phrase or term is one that can be understood by nonflying personnel when they have time to translate it, the unfamiliar words are still troublesome and inconvenient.

". . . one of the division fliers had 'bought the farm' "

Pity the young line officer who in his personal military education program has digested the more than 5,000 entries in the Dictionary of U. S. Army Terms (AR 320-5). He knows that "Elephant Steel Shelters" are not shelters for elephants but are for personnel and materiel—and are presumably as strong as elephants. He knows that "Decay Curves" have nothing to do with overage girls but are graph lines representing the decrease of radioactivity with the passage of time.

Then on his first day in the field as platoon commander he is confronted by an experienced aviator who tells him: "Pucker up[3] and get your gravel scratchers[4] under cover. The enemy birds[5] have TAR[6] and this zero-zero[7] won't keep them from flathatting in on our position[8] with their arm through the firewall[9] and their wings bristling[10]."

As new equipment and techniques are developed, the situation gets worse. Consider the following statement:

"We'll use VSTOL[11] craft to get the troops into the field. From there the heavy stuff will move by AGG[12] while the lighter stuff will be LUGed[13]. Personnel will IDG[14] or FLEEP[15]."

Can you understand it? Yet the equipment mentioned is either available today or in development stage and deals with aviation.

Army Aviators are not the only ones with "mumbo jumbo" problems. In the 22 December 1961 issue of TEC TAC, published by the U. S. Army Signal School, a letter points up the same type trouble in the Signal Corps.

The writer says: "Allow me to suggest that TEC TAC do something to combat the increasing use by Signal Corps people of technical terms that have no proper place in the vocabulary of signal men. . . .

". . . I would suggest that the use of pretentious terminology, instead of commending a signal officer, may often reveal a suspicious lack of information or of understanding on his part. . . .

"The pity of it is that there is no need in the Signal Corps for any but plain, simple, everyday words. . . ."

And for Army Aviation personnel the same holds true.

[1] Attributed to News Front, Management's News Magazine, August 1964, published by YEAR, Inc., 21 W 45th Street, New York, N. Y. 10036.

GLOSSARY

crashed
tense yourself
ground troops
aircraft
terrain avoidance radar
no effective visibility
flying at treetop level, nap of the earth
flying at full throttle
load of armament
vertical/short takeoff and landing
air cargo glider
light utility glider
individual drop glider
utility cargo vehicle

Captain John Koslosky

Our course was from Beirut to Naples, but en route heading is of little consequence if you fly with weather forecasts that go sour

Winging Westward

IT WAS a bright sunny morning when we arrived at the international airport in Beirut, Lebanon. As in most New and Middle East countries the formalities of customs, airport fees, gas payments had to be dealt with. Two of us were returning from extended TDY to India, and we were familiar with all the steps necessary for one to get an Army aircraft into the wild blue.

It being my turn to ride the right seat for the morning leg of the flight, I carefully went about the task of checking weather, filing a flight plan, and checking NOTAMs.

Let's go back to that weather check I mentioned. The weather at Beirut that December morning was a high scattered and visibility unlimited. The forecast for my destination was 3,000 broken with rainshowers and isolated T-storms. Minimum ceiling en route was forecast to be 3,000 broken in the vicinity of our fuel stop. Our route was direct from Beirut, Lebanon, to Athens, Greece, (for a fuel stop) and then to Naples, Italy, where we would spend the night.

Because of some towering Cu and isolated T-storms I decided to file VFR and was assured of a no-sweat by the civilian weatherman, who had an office full of rush-rush airline pilots. The worst I might find would be a few rainshowers to circumnavigate. With an armful of charts prepared by the friendly weatherman, I headed for the parking ramp where my compatriot was busily preflighting our rather weary U-8D (which is another story). Of course it had not been fueled, although we were assured the night before that it would be. No problem, however. With a minimum of confusion the bird was filled and we were winging westward, with an idea that we just might make it back to our home base before Christmas.

Beirut being located on the coast, we were out over the blue water minutes after takeoff. About 90 percent of the flight would be flown over water with the exception being mostly islands scattered en route. There was no terrain to consider, so 3,000 feet minimum ceiling sounded good.

The first 45 minutes was uneventful, except the ceiling was getting lower a lot faster than we had expected and there was light turbulence.

We were well out from Beirut when the ceiling dropped to 500 feet and turbulence began in-

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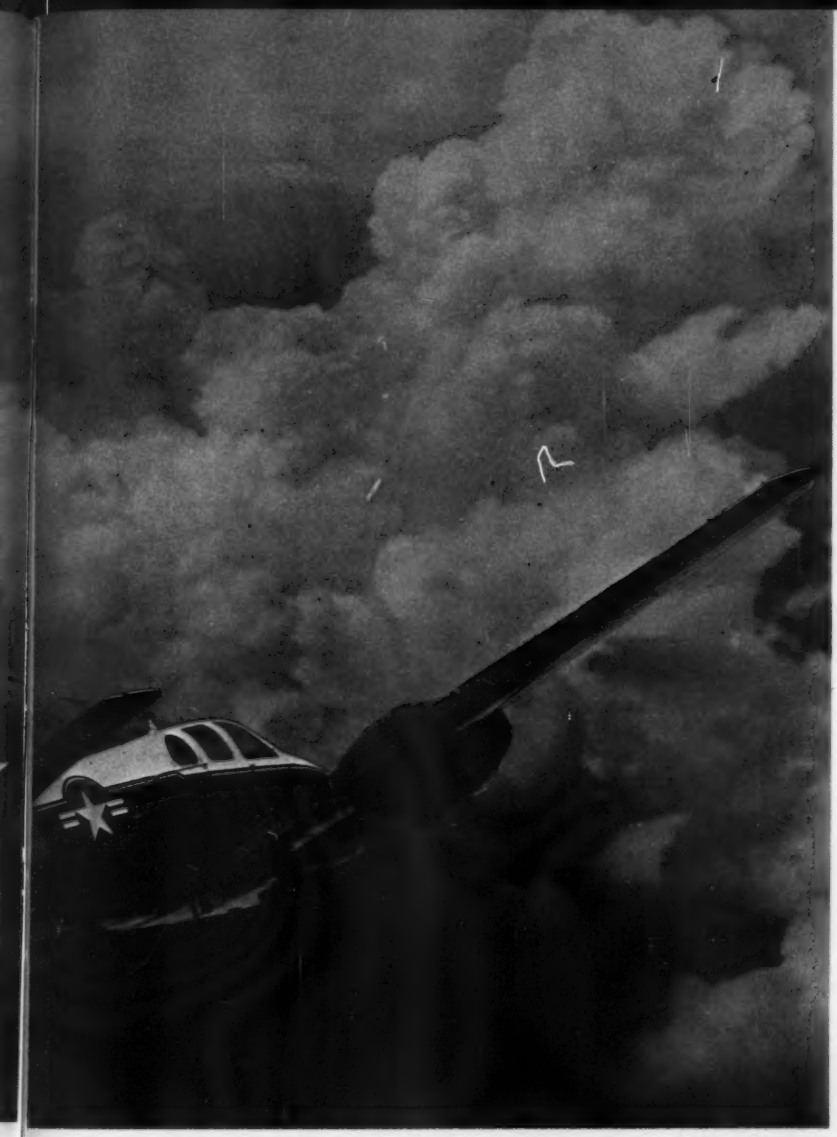
Capt Koslosky is assigned to duty in the Republic of Vietnam.



creasing. The cloud cover was broken so we had no problem urging our D model to 10,000 feet where we leveled off on top. As we had suspected, however, the middle morning clouds were building fast. Fourteen thousand was about as far as we could nurse our sick bird, which was also burdened with high frequency radio antennas that created additional drag.

Because of the communication difficulty we had been having in that area and the length of time it took to get an IFR flight plan filed in the air, we decided to get a clearance now while we had time. After many frustrating transmissions we received our clearance and were assigned to 13,000 feet. About this time there were isolated cumulous buildups in the neighborhood of 25,000 feet.

Radio transmissions were so broken that we couldn't even send position reports, to say nothing of our requests to fly around the buildups. We transmitted in the blind and then took necessary evasive action to avoid the towering Cu.

Finally the inevitable happened: we were surrounded. Without much choice in the matter we reluctantly picked a penetration point. Without radar this is a game comparable to Russian roulette. After going through a T-storm penetration check in the cockpit we entered the storm.

The reputation given these storms stood tall and proud that morning. We were well above the freezing level so we began picking up rime ice immediately. The turbulence was such that I adjusted the power while the pilot attempted to fly a decent attitude, with airspeed varying from one extreme to the other and power settings from METO to just enough to keep the carb heat acceptable. Altitude varied 1,000 feet each side of that assigned. Hail was accompanied by severe turbulence and then we were gratefully tossed out for a moment of rest.

This encounter was repeated a few times over but with less intensity. Finally we arrived at our fuel stop, Athens, with full intent of calling it a day—and what a day. We informed our crewchief that we would almost certainly RON in Athens, but just as a formality we would check with the weather forecaster.

I posed a negative question to the forecaster at Athens. "No chance of getting to Naples tonight is there?" He promptly told me Naples was CAVU and forecast to remain so for the rest of the night and tomorrow. As for T-storms, one storm was in the vicinity and that would lie well south of our course.

Well, we had been gone a long time and since there was no weather problem there was no reason not to proceed as planned.

After we filed an IFR flight plan, which was routine for night flying and mandatory for night flights in most countries, we had a bite to eat and then blasted off for Naples.

It was almost dark when we finally took off. About 10 minutes out from Athens we saw that T-storm, and it was about 10 miles south of course. That was the only accurate information we received in our weather briefing.

The flight was smooth and uneventful. Because it was mostly over water we saw no lights below; after a while we saw no stars above. I thought to myself, "The forecaster really blew the CAVU forecast," but at that time little did I know how badly he blew it. I patiently tried to see some sign of light on the water: a ship or glare or any sign of reference. Of course I never saw that sign and I don't really know how long we were on actual instruments.

Now came the big question: what type weather were we in and how long would it last and how low did it go? The free air temperature gauge read −15° C. Are we picking up ice? I dreaded turning on that landing light. When I did, it was like looking up into a shower nozzle—not rain but a solid sheet of water. We began picking up light rime on the leading edges and the antennas but lost only about 5 knots airspeed.

We tried to get a revision on our exploded forecast but the radios were full of static. We finally arrived over land and were to track inbound to a NDB and change our course from westward to north. Our newest problem came about when we tried for the tenth time to tune in this NDB and received absolutely nothing. Our course was now being held by a VOR which was located about 90 miles eastward and going off and on, as indicated by the off-on flag.

After the time to the ADF intersection (ETA) had passed, I decided to turn northward and try to pick up some form of navaid. The ADF seemed completely worthless, and now we were being called by Rome Control. They were concerned about our not reporting this beacon to which we were blindly tracking. After many transmissions we convinced Rome Control that we were not certain of our position and thusly could not comply with their request for our descent to 7,000 feet. According to our charts 7,000 feet would be disastrous if we had not passed this coastal beacon. Also, we could handle the ice we were accumulating at 12,000, but a change in temperature could set that rain out there into severe airframe ice.

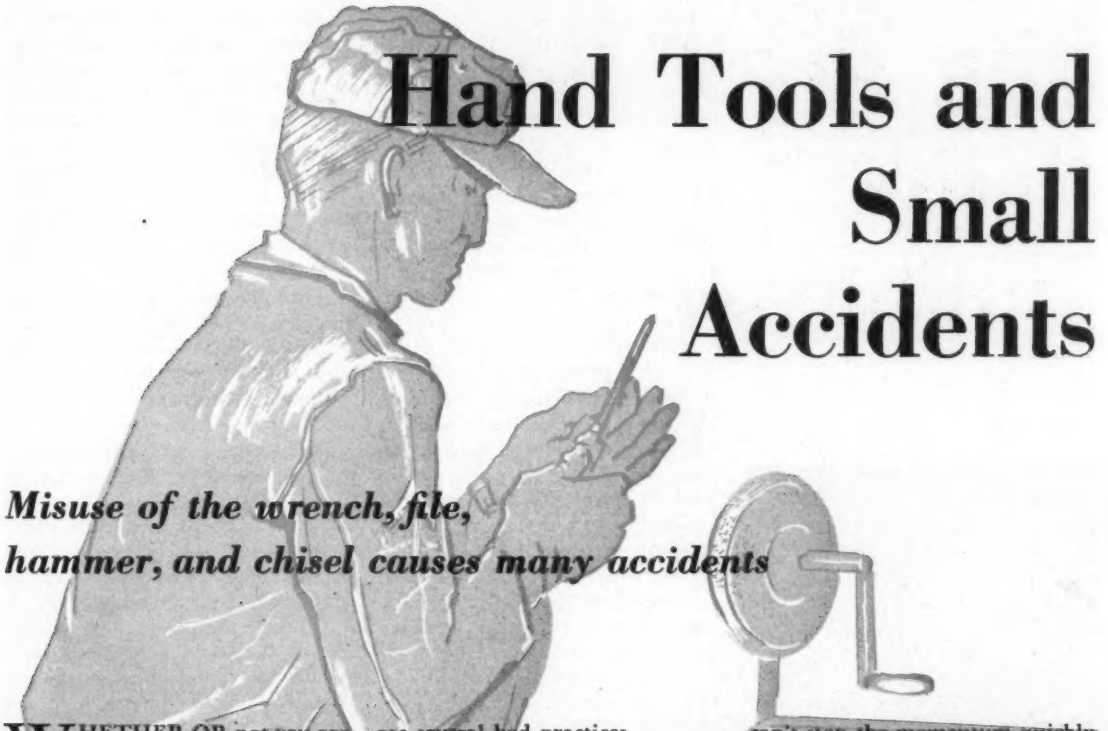
We finally got a controller who not only rogered clearances but actually understood English. He was very sympathetic and turned us over to Naples Radar, which promptly gave us a transponder code and had us on the ground after we broke out at 400 and 1.

The nice weather forecaster at Naples explained the phenomenon very thoroughly—except why we didn't pick up more ice with that much moisture at that temperature. At any rate, the next time we fly this route, I hope both the weather forecasting and communications will be better. After all, even Ulysses had the stars to navigate by.

Winning Writers

WINNERS OF the first two plaques presented for the best monthly articles in the ARMY AVIATION DIGEST receive their awards from Maj Gen John J. Tolson, Commandant, USAAVNS, Fort Rucker, Ala. Maj Frederick L. Clapp (center) won the contest for July with his concept for fighting an antiguerrilla war. WO Bruce P. Mauldin (left) earned his plaque for his article in the August issue which describes a new method of airlifting troops into a combat zone in Vietnam. (See "Help Wanted," inside back.)

Hand Tools and Small Accidents



Misuse of the wrench, file, hammer, and chisel causes many accidents

WHETHER OR not you are a mechanic, at some time in your life you will use a hand tool to loosen or tighten a nut, file a piece of metal, or chisel off the head of a bolt. And when you do you are a sitting duck for an accident.

Why? It's because hand tools are considered so simple that hardly anyone bothers to learn the correct way to use them. But improperly used they can cause painful, if not serious, injuries.

Mechanics at Guthrie Field, Fort Rucker, Ala., report that four small hand tools cause most of the accidents—the wrench, file, hammer, and chisel. Connected with the use of each of these tools are several bad practices.

At installations such as Guthrie Field, maintenance consists mostly of replacing parts or components. There is not much hammering, filing, or chiseling. Since wrenches are used quite extensively they naturally account for many injuries. On the other hand, files, hammers, and chisels are unfamiliar tools and cause accidents for this reason.

The habit of pushing on a wrench rather than pulling on it probably causes most of the small injuries with wrenches. When a tight nut is loosened, it comes free quickly and often unexpectedly. Or the wrench may slip off the nut. In either case you can't stop the momentum quickly enough, and more than likely you will strike your knuckles against something. But if you pull on the wrench, your knuckles are out of direct line of fire and this type accident can't happen.

When you can loosen or tighten a nut only by pushing on it, use the base of the palm and hold your hand open. This will save your knuckles and if your palm should hit something, its natural padding will cushion the blow.

Files cause a surprising number of accidents, especially when they have no protective handles. The danger in using files without protective handles is that the tangs are often quite sharp. When the

HAND TOOLS

file meets an obstruction and is suddenly stopped, the sharp tang can go through your hand. Before attempting to use a file, make sure it has a good, tight fitting handle.

Another important thing to remember about files is that they are no good as pry bars. The tang end is soft and bends easily. The body is made of brittle metal and any slight bending force will cause it to break. When this happens, the broken end usually flies up in your face.

Then there's the dangerous practice of hammering on files. The brittle metal will shatter, and the chips have a nasty habit of hitting your eyes or some other sensitive spot on your face.

The simplest hand tool in your kit is the hammer. It's also potentially the most dangerous. When in one piece it can smash fingers, and when it comes apart the head flies off with almost the speed of a bullet.

Before using a hammer, check to see that the head is on tight. If it's loose, don't use it.

The hole in the hammer head is called the eye. It tapers in both directions from the center. The handle is tapered to fit on one side of the eye. When you insert the handle into the eye you make it fit the other side by driving in a steel wedge.

If the handle is loose in the eye, it indicates that the steel wedge must be replaced by a larger one. If the wedge is missing replace it with another. Don't use nails or other metal objects as wedges; they are not properly shaped to hold the handle on tightly.

Another tool that mechanics at Guthrie Field have learned to handle with care is the chisel.

It's obvious that the hand holding a chisel is in danger of being hit by the hammer. There's no way to prevent this if your aim is bad, but there is a way to lessen the blow. The technique is to hold the chisel in the left hand with the thumb and first finger about an inch and a half from the top. Your grip should be steady but rather loose. If you miss the chisel and strike your hand it will slide down, thus lessening the effect.

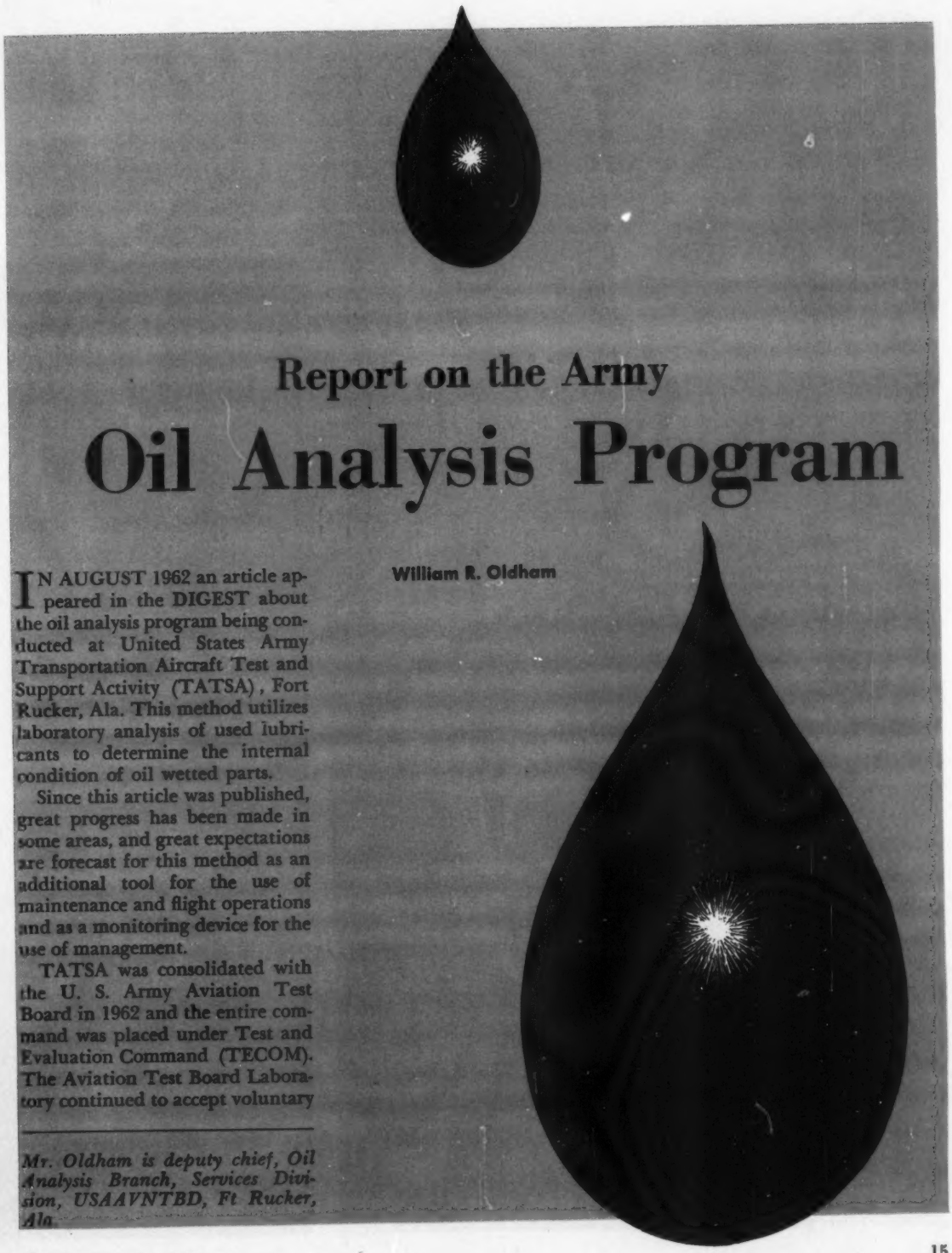
When striking the chisel with a hammer, look at the cutting edge of the chisel and not the head. Grip the handle of the hammer near the end. This makes the face of the hammer contact the head of the chisel on a flat plane and lessens the chance of its slipping off and onto your hand. Strike one or two light blows to get the feel, and then hit harder.

When chipping, be sure to wear goggles. And watch out for bystanders. If they are close they should have goggles also. Always chip away from you, never toward yourself.

Keep chisels dressed. There is less chance of a slip if the cutting edge is sharp. The head also needs attention. If it is mushroomed, grind it down. Mushroom edges have a tendency to fly off, and the rough edges can be rough indeed.

These are only a few of the many dangers of using hand tools. There are many more, of course. You become a "pro" when you work so carefully that you have no need for a first-aid kit.

Top: Before using a hammer be sure the head is on tight. If it is loose you may have to insert a new wedge. Botton, left: When the file meets an obstruction and is suddenly stopped, the tang, if exposed, may puncture your hand. Middle: Hold a chisel near the top. If you should hit your hand, it will slip down, thus cushioning the blow. Right: If possible, pull on a wrench instead of pushing.



Report on the Army

Oil Analysis Program

William R. Oldham

IN AUGUST 1962 an article appeared in the DIGEST about the oil analysis program being conducted at United States Army Transportation Aircraft Test and Support Activity (TATSA), Fort Rucker, Ala. This method utilizes laboratory analysis of used lubricants to determine the internal condition of oil wetted parts.

Since this article was published, great progress has been made in some areas, and great expectations are forecast for this method as an additional tool for the use of maintenance and flight operations and as a monitoring device for the use of management.

TATSA was consolidated with the U. S. Army Aviation Test Board in 1962 and the entire command was placed under Test and Evaluation Command (TECOM). The Aviation Test Board Laboratory continued to accept voluntary

Mr. Oldham is deputy chief, Oil Analysis Branch, Services Division, USAAVNTBD, Ft Rucker, Ala.

contributions until the fall of 1964 for the following reasons:

The capacity of the spectrometer.

The need for a large number of samples to obtain sound evaluation criteria.

The need to prove the system operable with field units.

The desire for operational units to use the system for failure prevention.

At that time over 2,000 aircraft were being monitored at Fort Rucker and the 3,500 major components of these aircraft were producing 700 to 800 samples per week. The workload became so large that the staff could not adequately evaluate more aircraft, and the lab has since had to refuse this service to many requesters.

In 1963, U. S. Army Aeronautical Depot Maintenance Center (AADMAC), Corpus Christi, Texas, placed in operation a similar instrument that could perform oil analysis in conjunction with other spectrographic work. [See DIGEST, March 64.] The laboratory is continuing an orderly expansion of the program that will ultimately include all of Army Aviation. In January 1965, this AADMAC laboratory staff was increased to enable it to monitor aircraft in the Far East.

U. S. Army Board for Aviation Accident Research (USABAAR) has long advocated the use of oil analysis as an early warning device and urged its widespread usage. Through its efforts, the interest of higher headquarters has increased. A proposed Army regulation is being staffed under which the oil analysis program will realize a much greater potential. Upon its approval, Army-wide use of oil analysis will be realized. Other non-aviation components may be monitored if justifiable.

The spectrographic technique used by the Aviation Test Board Oil Analysis Laboratory to analyze an oil sample is based upon a

Incorrect sampling technique. Use only when tube cannot be used. Drain one pint first to remove dirt and sludge.

process involving the excitation of metal atoms with an alternating current spark. Sample oil is burned and through a series of wave lengths derived from defracting equipment, the concentration of metal in the oil is determined. The entire sample is processed in 2 minutes, 10 seconds.

Results obtained from the sample are then compared to the sample history of the particular engine from which the sample was taken. A marked increase in wear metal content is a sign of possible trouble within the component. One high reading is usually followed by an immediate laboratory request for a resample. If the resample continues to read high, an inspection is requested.

Left and below: Proper sampling techniques for oil analysis lab use

Between September 1961 and January 1965, the laboratory discovered over 160 engines and transmissions that might have failed had their weaknesses not been detected in the oil analysis program. In each of these instances—

Spectrometric results showed increased wear.

The laboratory notified the operator.

Maintenance or teardown verified laboratory findings.

These findings were reported back to the laboratory.

Other discrepancies have been discovered by the laboratory, but since one of the four steps listed was missing, the discrepancy has either counted against the program accuracy or remained in the suspect category on into overhaul, and the teardown results were not made known to the laboratory.

As the four steps required for verified success illustrate, one of the most important single factors affecting oil analysis is communication. If the operator does not participate in the program enthusiastically, the analytical results are largely meaningless. The laboratory knows only as much about an engine or transmission as can be gathered from operators and manufacturers. Therefore, up to a point the operator will receive only as much assistance from the laboratory as he contributes.

To illustrate: oil consumption of the aft transmission from CH-XX has increased above normal (new oil has no significant amount of metal in it). The laboratory observes a slight but steady increase in the iron, aluminum and copper, but remains silent because there is no need to alarm anyone for such a small increase. Hours later CH-XX is involved in a crash due to failure of a mast bearing (iron bearing

OIL ANALYSIS

and race, bronze cage, aluminum housing). Here was pertinent information within reach of the mechanic, the operations officer, the maintenance officer and the laboratory via TWX, FONECON, semaphore, or visit. Each factor, though insignificant individually, helps to complete the puzzle.

It is interesting to note that identical sampling problems occur in the oil analysis programs of the Army, Navy and Air Force. Some points to remember are—

• Take the sample properly. (The lab has no need for sludge, new oil, cigarette butts or sand.)

• Fill out the sample information sheet completely. (The lab would like to know where you got the oil and why you are sending it.)

• Air mail it quickly. (Until toolboxes, outbaskets and desk

Alert crewchief plus oil analysis sample head off

Potential Accident

Adapted from "Sky Soldier," Safety Bulletin, Feb-Mar 1965

AN OH-13S, belonging to the 11th Aviation Company (GS), 11th AAD (T), was entered into the oil analysis program in May 1964. Samples were regularly submitted and the results of each sample showed that a normal amount of engine and transmission wear was occurring. In December of 1964, however, the records of the oil analysis laboratory reflected an unusually large amount of wear metal in the oil sample. A caution notation was placed on the records of the Sioux.

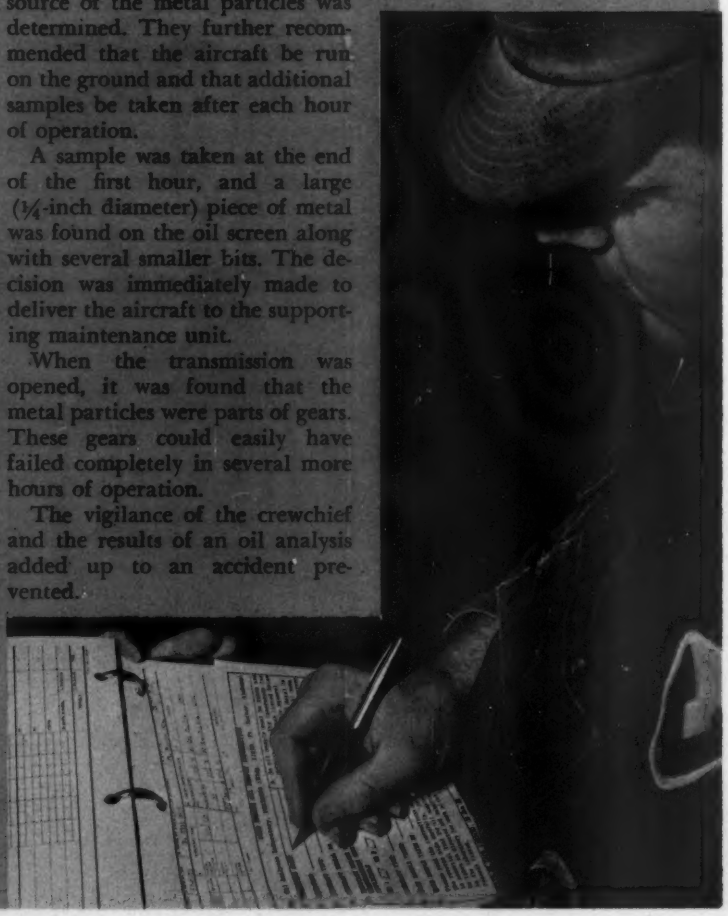
In February 1965, a number two inspection was performed by the crewchief in the Support Platoon and an oil sample taken. When he pulled the oil filter screen, he noticed several small metal particles present. He took the particles he found to the unit tech inspector, who also examined them. It was decided that extra attention should be given to the analysis of the oil sample that had just been taken.

The support platoon maintenance officer and the tech inspector took the oil sample to the oil analysis laboratory at Fort Rucker. In a few moments the test was completed and the results showed an unusually large amount of wear metal present. Laboratory personnel recommended that the aircraft be grounded until the source of the metal particles was determined. They further recommended that the aircraft be run on the ground and that additional samples be taken after each hour of operation.

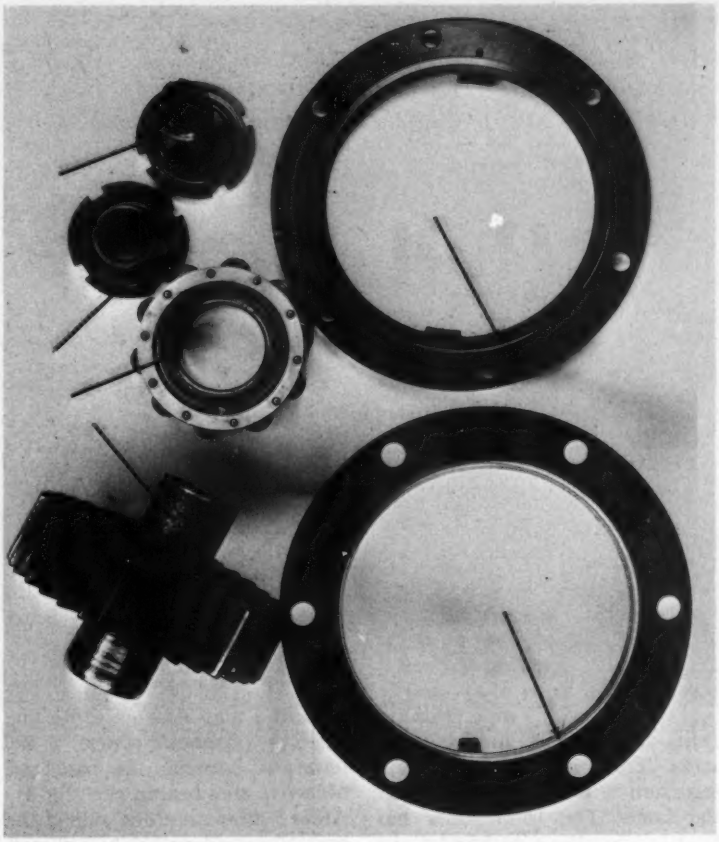
A sample was taken at the end of the first hour, and a large (¼-inch diameter) piece of metal was found on the oil screen along with several smaller bits. The decision was immediately made to deliver the aircraft to the supporting maintenance unit.

When the transmission was opened, it was found that the metal particles were parts of gears. These gears could easily have failed completely in several more hours of operation.

The vigilance of the crewchief and the results of an oil analysis added up to an accident prevented.



If the operator does not participate in the program enthusiastically, the analytical results are largely meaningless.



Metal particles from loose clamps and scarred bearing retaining plate (T53-L-1A engine) show up in oil analysis and pinpoints potential dangerous breakdown condition

drawers are converted to spectrometers, you must rely on the ones at the laboratories.)

• Sample *anytime* you perform maintenance on components that might affect the lubricant. (We may not help you this time, but . . .)

• Keep the lab informed as to who to notify in case unusual wear is observed. (It is difficult to panic others when you can't find the button.)

While we are on this somber note, let's briefly list the limitations of the oil analysis program.

• The spectrometer can only measure metal that is in solution or suspension in the oil; therefore, only wear will be measured. So-called materiel failures will not be seen; neither will pilot error.

• The wear must occur over a long enough period for a sample or two to get to the laboratory.

To expand slightly, answer for yourself: How many *wear* failures occur in Army aircraft as opposed to other discrepancies? Now you can see why the percentage of discoveries is so low when compared to the number of aircraft being monitored. Also, you can see that contact with the laboratory will be rare.

Beyond doubt, the oil analysis program has economically justified itself; yet there is no way to place a true value on something that did not occur or something that was corrected with a minimum of cost and inconvenience. Neither can you accurately value the increase of mission reliability or increased safety that is assisted by this method.

One seldom used major benefit of the oil analysis program is its ability to conclusively determine a "good" component insofar as wear is concerned. The laboratory cannot always predict a failure, but if oil consumption is normal the laboratory can *always* say that the component is not wearing abnormally. The ultimate usage of oil analysis would be to stop the wear failures that occur before the usual TBO, while permitting normal components to continue in operation until they too begin to wear abnormally.

Certainly, the above statement is an oversimplification; however, if the oil analysis program could assist in a TBO extension of a few hours the economic impact would be both immediate and substantial.

Oil analysis is not a cure-all; neither can it replace existing procedures. However, properly used, it can enter your toolbox, your cockpit, and your taxpaying pocketbook.

Here's a significant attempt to devise an all-weather tactical air traffic control system for helicopter use in the forward battle area using presently available equipment

Red Dog

Major Al Smith

AN ASSAULT force of twenty UH-1 helicopters must be moved from a base area into a forward area 30 miles away. A 500-foot overcast with 1 mile visibility exists at both base and objective areas. En route conditions are zero/zero and forecast to remain the same. The commander has readily available a pathfinder element with its organic equipment and nondirectional beacons. This operation is to be conducted using a system of command control called Red Dog.

Red Dog is a simple, quick, point-to-point airway system that provides a commander an excellent means to accomplish his mission and exercise command control over his aircraft at distances up to 50 miles. It is especially adaptable to operations or tactical situations where instrument flight conditions en route may prevent or unduly delay an operation. Consisting primarily of two nondirectional homing beacons, Red Dog picks up where AATRI (Army Air Traffic Regulations and Identification System) leaves off — at division — and operates from there into the forward battle area.

SETTING UP

From a map study, a centerline heading (magnetic course) is determined between the base and objective area beacon site (fig. 1). Areas 3 miles on either side of the centerline and within a 5-10 mile radius of both terminal ends are marked off for close study of terrain or obstacle heights.

Based on the map study, and when possible previous terrain study, a minimum altitude or level is determined for safe flight between the base and objective area. It provides a minimum of 400 feet vertical clearance from all terrain or obstacles within 3 nautical miles of either side of the centerline and within a 5-10 mile radius of both terminals. Next, five additional flight levels are determined, each one being 400 feet above the other for a total of six levels (fig. 1).

The number of flight levels established depends upon factors such as:

- how fast the aircraft must arrive at destination,
- how much usable airspace is available to the commander,
- how many aircraft must be inserted into the system,
- what the distance is between the base and objective areas,
- whether or not mixed types of aircraft will be used,
- aircraft loading requirements,
- enemy radar capabilities.

Various flight levels are designated for departures and returns. For example, the lower three levels might be for aircraft going to the objective area and the upper three for those returning. Variations of this system might be employed as necessary. Perhaps all levels could be reserved for one-way traffic for certain periods

UH-1 formations race to join up for troop delivery and assault after release from Red Dog system onto objective

of time, or lower levels could be held open for emergencies.

Charts are prepared listing headings, altitudes, pertinent climb, cruise and descent speeds for use in departing, returning, missed approaches and emergency procedures. Other information relative to beacon frequencies, identifiers, and other communications procedures are included. These charts are issued (or the information therefrom) to all aviators and pathfinder personnel involved in the operation.

After the date and time for beginning the operation is established, the commander deploys his pathfinder elements to establish a base site and objective area site. Each site must be clear of enemy within a 5-10 nautical mile radius and a nondirectional homing beacon established on predetermined frequencies with appropriate call signs and complementary communications system.

After a final check on the weather, equipment, and personnel the operation begins. One beacon is located at the base or marshalling area and the other at the destination or secured objective area. In large-scale operations an emergency backup beacon would probably be flown into the objective area with the first airlift.

Four types of beacons have been tried during Red Dog experiments in the 11th Air Assault Division:

- The AN/GNR-6 standard range beacon, which was considered too heavy (9,308 lbs).
- The HRT-2 State Department beacon, which weighs 25 pounds.
- The Tridea, an off-the-shelf item with a 100-watt output amplifier. It weighs 35 pounds (50 with amplifier).
- The AN/PRT-7 developed by Special Forces. It weighs about 20 pounds.

Under direction of a dispatcher/controller, aircraft are released to departure levels in time intervals to allow a minimum longitudinal separation of 5 minutes between UH-1 type aircraft on the same level and 4 minutes between CH-47 type aircraft on the

RED DOG

same level. (This difference in separation is based upon the relative speed of the aircraft.) Mixing UH-1s with CH-47s on the same level is avoided.

With these separation times and using six one-way flight levels seventy UH-1s or ninety CH-47s can be handled per hour. The development of advanced avionics equipment will probably allow formation flights at each level—thus increasing the volume of traffic.

All climbs and descents are made at the rate of 60 knots and 800 feet/minute. Cruise speed is established at 80 knots for UH-1, and 110 knots for CH-47. (Other rates of climb and descent may be necessary due to size of terminal area or aircraft limitations when fully loaded.) All altitudes are MSL.

For departure from base area, a controller/dispatcher issues a clearance code number (i.e., D-1, D-2, etc.) and clears the aircraft for departure on a time interval basis. Upon departure, aircraft climb to assigned altitudes on a predetermined heading to intercept and fly an outbound track from the base beacon, which coincides with the inbound track of the objective area beacon.

Arriving over the destination beacon, the aviator, dependent upon the assigned departure clearance, either

- turns left 45° and holds heading
- turns right 45° and holds heading
- continues straight ahead

for a period of 30 seconds; then on the same heading, he begins a descent to visual flight conditions. Upon reaching visual conditions, the aviator turns right 180° and proceeds to track inbound to the beacon under VFR separation and consequent landing under control of pathfinders or other ground control personnel.

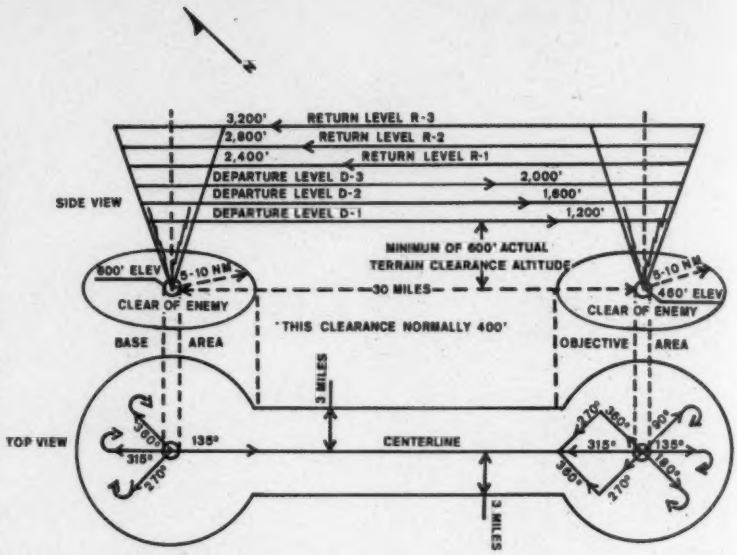


Figure 1. Red Dog system of flight separation and en route levels

The advantage of a beacon located within the center of the overall objective area is twofold. It provides a homing device for the pilot after breaking out VFR in an unfamiliar area, and it eliminates the necessity of securing two separate areas.

MISSED APPROACHES

Missed approach procedures consist mainly of the following:

- Hold minimum descent altitude (normally 200 feet absolute) and take up prescribed heading for 30 seconds.
- Report missed approach to ground control.
- Climb to and maintain predetermined altitude on prescribed heading.
- Upon reaching altitude, execute left turn to fly directly to the beacon and proceed as directed by the ground controller.

When leaving the objective area, a code and time interval departure system is again used. Based upon the clearance code number, the aviator (after taking off and flying directly over the beacon) assumes a heading 45° from the desired departure track. He holds this heading for 3 minutes and 45 seconds after passing the beacon (to insure lateral separation), then climbs to predesignated altitude. After reaching altitude, the aircraft is turned 90° to intercept and fly the return track to the base area beacon. The same approach techniques are employed as in the objective area (fig. 2).

Emergency return procedures may be required by some situations, such as loss of the assault area beacon. When such loss occurs, ground controllers will order the execution of emergency return procedures. Upon controller's order, aircraft en route to the faulty beacon will be turned to a predetermined heading and flown to their point of origin where predesignated approach and landing procedures will be followed. Execution of emergency return

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Major Smith was administration officer for Project TEAM, Ft Benning, Ga., when he wrote this article. He is now serving in Korea.

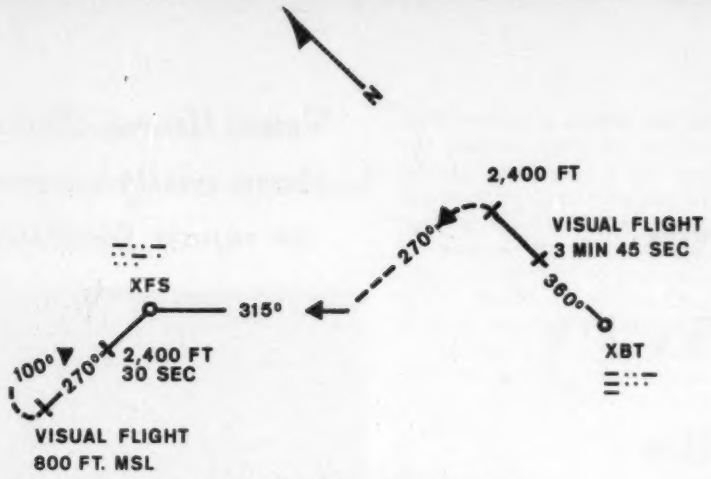


Figure 2. Example of code and time interval departure system

procedures may be initiated as necessary, *but only by ground controllers.*

WEATHER RESTRICTION

Actual weather imposes one restriction to a Red Dog operation. There must be a minimum ceiling of 200 feet and a minimum visibility of 1/4 mile in a 5-10 mile radius from both the base and objective area nondirectional beacons.

Another factor that must be considered is the requirement for "sterilization" of the airspace being utilized for a Red Dog operation. This will normally be accomplished by the FOC's setting aside a block of airspace into which no air traffic will be cleared during the period of the operation.

A major advantage of the Red Dog system is that an aviator on a normal round trip is required to make a maximum of only two climbs, two descents, and four turns while under instrument flight conditions. A copilot handles all navigation and communications so the pilot can give his full attention to flying the aircraft.

An additional major advantage of the Red Dog system is the simplicity of communications. FM or UHF equipment in use today will easily meet the limited requirements. Also, with the exception of a missed approach or an emergency situation (such as loss of a beacon), no airborne radio transmissions are required. Because of its closed-circuit type operation, although the traffic density may be exceptionally high, the inherent features of this system greatly reduce the possibility of, or necessity for, a breach of communications security.

The Army plans to continue evaluating the Red Dog concept. Although still in the Model T stage, it nevertheless represents a significant development in helicopter instrument flight operations in the forward battle area. And, it's destined to improve with technical advances in avionics.

The Federal Aviation Agency has expressed considerable interest in Red Dog. After reviewing the concept, FAA personnel helped develop the system by providing technical assistance (mostly in the air traffic control field) through the National Aviation Facilities Experimental Center (NAFEC), Atlantic City, N. J. About 1,000 hours of evaluation were conducted through FAA's unique $10 million flight simulator complex and other facilities while reducing the concept to established procedures for actual flight testing.

Chinooks climbing to separation levels after going IFR en route to objective. Ninety CH-47s can be handled each hour using Red Dog system of separation/control.

Sioux, Hueys, Chinooks, a
been easily recovered an
to repair facilities by th

Aircraft Recovery with the Chinook

Captain Dwight N. Jackson

THE MISSION was aerial recovery of an OH-13H, which was upside down in a swampy area in pine trees approximately 100 feet tall and located 65 miles from home station. This was the request received by the operations officer of Company A, 228th Assault Support Helicopter Battalion (Chinook), 11th Air Assault Division (Test) at 1530 hours on 20 January 1964.

Could the recovery of the Sioux be accomplished by the Chinook with only three hours of daylight remaining? With the ingenuity of the recovery team from the aircraft maintenance battalion, the versatile capabilities of the Chinook and the professional skill of the crew, the mission was accomplished.

In this instance, the Chinook was hovered at treetop level by the pilots while two members of the recovery team were lowered by hoist to prepare the Sioux for lifting. A 150-foot length of steel cable was used to attach the aircraft to the cargo hook of the Chinook. The crashed Sioux was lifted from the swamp and deposited on a nearby airfield. The Chinook returned to pick up the recovery team members then returned to home station with the recovered aircraft as an external load.

This was one of several aerial recoveries effected using the Chinook as the recovery aircraft. Others include lifting a Mohawk with a wiped out landing gear 180 miles to the Atlanta General Depot for major repair, and recovering an Iroquois at night. These missions have been accomplished by organizing recovery teams from the aircraft maintenance battalion and putting together recovery kits for each type of aircraft and situation. Some of the items included in these kits are pioneer tools, lighting sets, aircraft hoisting slings, etc.

Mohawk Recovery

To prepare the Mohawk for

Capt Jackson was with the 228th Assault Support Helicopter Battalion, Ft Benning, Ga., when he wrote this article.

and Mohawks have and quickly transported the CH-47

aerial recovery, rudder and elevator controls must be locked in neutral position and the propellers must be tied to prevent windmilling. An OV-1 hoisting sling is attached to the Mohawk and an 8-foot nylon sling strap is used to allow clearance between the two aircraft. Approximately one hour is required for two men to prepare a downed Mohawk for recovery. Chinook pilots of the first Mohawk recovery said they could fly 80 knots with the Mohawk attached. On the first recovery, spoilers were tied to the wings to prevent floating and a windsock was tied to the tail jacking point to aid in streamlining. During the most recent recovery, it was found that this action was not necessary.

The OV-1B, with full fuel and all components installed, can be lifted approximately 60 nautical miles by the Chinook with a 30 minute fuel reserve remaining. By defueling the Mohawk it can be lifted approximately 120 nautical miles, allowing for fuel reserve.

Iroquois Recovery

An Iroquois with full fuel and heavy armament installed can be lifted for the full fuel range of the Chinook. Blades may be left on the UH-1 by blocking the mast and using a fabricated blade leveling yoke to prevent damage. The Iroquois is lifted with a 6-foot nylon sling fastened to the lifting eye of the mast. Preparation for aerial recovery requires approximately 30 minutes. The UH-1 streamlines when the recovery aircraft moves forward.

Chinook Recovery

Normally a downed Chinook will be repaired and flown out; however, aerial recovery is possible when repair is not practical. A Chinook can be recovered by another Chinook, operating at 33,000 pounds gross weight, by defueling, removing the blades, rotor heads, transmissions and engines. This allows the stripped Chinook to be lifted 70 nautical miles with a 30-minute fuel reserve at optimum flight conditions.

A minimum of four personnel are required to prepare a Chinook for aerial recovery. By use of the maintenance davit, a crane device which attaches to the Chinook when in an upright position, the necessary components can be removed and the aircraft defueled and readied for recovery in approximately 8 hours. If the downed aircraft is lying on its side it can probably be uprighted by installing the hoisting sling and pulling it upright with the recovery Chinook. Then the maintenance davit could be installed and the components removed.

At this writing, two Chinooks have been lifted using another Chinook as the recovery aircraft. The biggest problem encountered was getting the recovered Chinook to streamline in flight. When the first one was lifted, a drag chute was attached to aid in streamlining the recovered aircraft. After takeoff, the recovered aircraft streamlined nicely at first. However, during climbout the drag chute began to twist and finally collapsed itself. When this happened the recovered aircraft turned broadside and created too great a drag force for the recovery aircraft to maintain safe flight. The Chinook was released from approximately 2,000 feet altitude.

Suggested solutions to this problem are to put a swivel in the line securing the drag chute so it can twist freely or to replace the drag chute with two or three large windsocks.

The second Chinook recovery was successful although streamlining was still a problem. The pilots said they could not fly faster than 40 knots due to drag caused by the turning of the external load.

CWO Robert R. Vaughn, Jr.

CIRCLE of Safety

SPECIALIST-5 Crue A. Cheef pulled his flight parka tightly about him and drew the hood over his head to help ward off the cold of the dark early morning. He trudged through the snow and out to the flight line to preflight his "bird."

"There's not one reason in the world why I have to be out here this early," he thought. "We won't get weather until around 0900 or 1000 this morning, if we get it that early. But try and tell Operations that. They are too eager to jump through the apex everytime some colonel needs a ride."

Specialist Cheef approached the squatting UH-1B ignominiously covered with snow.

"Must be 3 inches of snow on this thing," he thought. "Well, I'll daily it after I run it up. The blades will blow most of the snow off."

Cheef wiped off the windshield on the pilot's side and hopped into the seat.

"I thought Helper was supposed to be out here somewhere," he said to himself disgustedly. "I planned on using him as a fire-guard. Oh well, I'll just start without one; I can use the EGT and fire-warning light."

Cheef pushed in the ignition and starter circuit breakers, flicked on the battery, and pulled the starter trigger. The turbine engine started its whine, and the gauges began their reluctant climb to power.

"That's funny," Cheef thought, "the blades should be turning by now." He sat in the seat, looking at the blade hanging way out in front of the ship. The whine of the engine told him it was starting, but the blade just stayed there. "Well, it takes a long time for these blades to start turning though," he said to himself.

He suddenly remembered that start fuel was still turned on and the starter trigger was still pulled. He released both with a start, failing to notice that the EGT hit 700.

Suddenly he felt a slight lurch and the blade began to turn. He didn't notice the tie-down block get thrown across the fence and into the motor pool of the truck company next door.

He completed the runup. Then for good measure he decided to add a little pitch to make sure enough motor wash came down to rid the ship of the snow.

"No sweat on this thing," he thought. "Mister Flier let me pick it up today. I can pull in a little pitch and handle it all right. I won't put over 20 psi on it, and—"

Cheef pulled up on pitch and

Mr. Vaughn is maintenance officer for D Troop, 3/7 Cavalry, APO New York 09036.

noticed with satisfaction that snow was flying about everywhere. No doubt, when he got finished the aircraft would be clean.

"Let's see now," he thought, "add a little power, push left pedal. Well, here goes."

He pulled pitch up, keeping his eye on torque, and at the same time he slammed left pedal in. "Pretty smart of me to remember that," he complimented himself.

Suddenly the ship gave a sickening lurch to the left. Cheef slammed the pitch back down and stomped right pedal so hard that he heard the pop of the cable stop. The helicopter reversed its spin and pivoted hard to the right, winding up almost 180° from its original heading.

Cheef sat frozen to the controls for a second. When he decided that everything had stabilized, he rolled throttle off (he forgot the beep button), noticed that the rpm warning light didn't come on, pushed the detent button, and shut the engine off. He took the -13 out, signed off the daily, and entered the defective rpm warning light.

"Well, time for coffee," he said to himself as he walked away from the aircraft, its blades still turning in protest. "It's these early morning jobs that make us crewchiefs earn our pay."

As it sat there, the aircraft groaned, squeaked and popped. The small crack in the tail boom that had started several flights ago, and had been missed every daily, had become large enough to be seen very easily now—if the melting snow hadn't refrozen over it and sealed it off.

• • •

Captain Schedule leafed through the papers on his desk and saw the reminder to check the time on 113. It was only 1 hour and 45 minutes out of PE. He scheduled it to return Colonel Bulle to headquarters—a short 2 hour trip. Nothing like getting the maximum utilization out of a ship. It would be overdue by the time it got back but would go over in the air, so he would be covered. That still left three other ships flyable. The maintenance officer had protested a little, but he didn't have to worry about meeting commitments with division, so let him squawk.

• • •

Lieutenant Bachelor checked his watch as he walked up the steps of the operations office. He was already 45 minutes late for work this morning, but that was understandable since he didn't get in bed until 0530. After all, he had to have some sleep to offset the alcohol he had consumed last night. He chuckled to himself as he recalled the way the four of them had done a dance routine on the bar at a local night spot about 0400 in the morning. The other three were off duty this morning, but—well, he was young, with amazing recuperative powers. . . .

"Good morning, Lieutenant Bachelor," Sergeant Noncom yelled when Bachelor entered the orderly room.

The lieutenant winced under the pain of the sudden noise. "Not so piercing man, please, not so piercing," Bachelor answered.

"Oh, I see," the sergeant answered. "Big night, huh?"

"Yes, I think I will sneak down to the supply room and just die on one of the mattresses there."

"Can't do it, sir; you have an 0830 takeoff," Sergeant Noncom answered as he briefed Bachelor about his passenger, Colonel Bulle.

James Bond was facing his hardest test, and Specialist-4 Notams was engrossed in the adventure, sure that his hero would escape, as he always did. Then again, just to be sure, he had better stick with the book until this part of it was over anyway.

"Here is some new weather, Notams," Messinger said, laying a folder down on the desk.

"Yeah, thanks Messinger, I'll post it right away."

"Good morning, sir," Messinger said to Lieutenant Bachelor as he left.

"Good morning, Messinger.

"Got weather to Centerville?"

"Yes, sir, just what you see on the board," Notams answered, reluctantly laying *From Russia With Love* face down on the folder of new weather information that Messinger had just brought him.

Bachelor scrawled the information across his 175, then signed what could have been his name on the bottom.

"We ready to go?" he asked Cheef as he approached the ship, and exchanged greetings with his passenger.

CIRCLE OF SAFETY

"Yes, sir," Cheef answered, putting down this month's *Playboy*.

"Good, my head is much too big to preflight this thing. You've dailied it, haven't you?"

"Yes, sir; it's all ready."

"Good. We've got weather; let's go."

Notams looked up as the UH-1B roared past the window, spilling his coffee in the process. "Darn! Well thank goodness, none of it got on my book, just these papers here. Wonder what they are? Oh, some old weather."

Notams threw the warning of the high turbulent weather in the vicinity of Centerville into the waste basket, and went back to helping James Bond escape Spectre's hired killer.

Lieutenant Bachelor looked in the back and saw that the colonel was busy looking over some notes, and didn't have the headset on.

"Somebody left this thing beeped up. I was lucky I didn't get a hot start," he said.

"Yes, sir, I guess it was me; I forgot," Cheef admitted.

"Well, watch it in the future."

"Yes, sir."

Bachelor strained to stay awake. The rush of the squelch in the earphones soothed him, the heat from the bleed air relaxed him, and he hung in the shoulder harness only barely awake.

Suddenly he was awakened with a start! Severe turbulence slammed him around like a Ping-pong ball on the ocean, and he fought to regain control of the ship.

Thankfully the aircraft never entered any attitude from which it couldn't be recovered, and Bachelor managed to stabilize the descent and the gyrations.

"There wasn't anything in the briefing about severe turbulent area," Bachelor growled over the intercom.

"We gonna make it okay, sir?"

"Yeah, no sweat; this is a solidly built aircraft and can take a lot of punishment. How is the colonel?"

"He looks scared."

Bachelor looked around and said something encouraging and the colonel perked up a bit.

Outside the aircraft, the cold air whipped by the sleek, waspwaisted UH-1B, caressing the streamlined contours gracefully—except in the area of the tail boom, where it was burbling. The burbling was caused by the crack that had greatly enlarged with the last violent stress put on it by the turbulence tossed ship.

"Centerville Tower, this is Army 709, passing through your control zone, across the north end of your strip at 2,000 feet indicated."

"Roger, 709, negative traffic. What type aircraft?"

"OV-1."

"Roger."

"Well, we made it Cheef; there's the airfield. What's their freq anyway? I want to ask them for clearance for an autorotation."

"I don't know, sir."

"Never mind; here it is. By the way, turn the audio rpm off. I don't want that thing driving me batty during the descent."

"Centerville Tower, this is Army 113; request clearance to shoot an autorotation on one eight."

"Doggone it, this thing sure is busy," PFC Mike Button said as he put down the crossword puzzle and walked over to the radio again.

"Roger, 113, clear to land at pilot's discretion; negative traffic in local area."

Bachelor started an autorotation from 3,000 feet. An approaching Mohawk bore relentlessly toward him. At about 100 feet above a sure collision Bachelor saw him. He grabbed pitch in a death grip, and didn't feel himself depress the detent button. His grip rolled the throttle off and the engine died, but Bachelor didn't realize it and rolled the now useless throttle the rest of the way on. The Mohawk shot by beneath them and Bachelor, who had his eyes on it, breathed a sigh of relief.

He took a quick look at the rpm limit light and saw that it wasn't on, so he knew he had his engine rpm back again—or did he? The aircraft started to descend again. He looked back at the instrument panel; the tach was unwinding. **Both rotor and engine were way down, and the engine—impossible! The light wasn't on!** Only one thing to do now: try to get rotor rpm back. He dumped the pitch and willed rotor rpm to rise. Good, good, it's coming back, it's almost there. . .

Observers on the ground saw the tail boom whip around for some unexplained reason, then separate, as the aircraft plummeted to the ground.

If the board had had access to all the facts, they still would be hard pressed to put the blame on any one thing. **The little things that can slip by, occasionally, can be compounded into a chain of events that renders an accident inevitable.**

If the daily had been properly pulled, if the runup had been properly done, if scheduling had not tried to cheat on the hours, if weather had been properly posted, if the pilot had read the -13, preflighted, or been more alert, if the tower had remembered the traffic in the pattern, the accident might have been avoided.

When any person in Army Aviation neglects his full responsibility to himself, his aircraft, or his job he breaks the circle of safety and sets the stage for an accident.

ARMY

Santo Domingo

SWEEPING IN from the sea, the Army's 229th Assault Helicopter Battalion task force arrived in the Dominican Republic on May 5th to provide an air transport capability for the 82d Airborne Division on duty in Santo Domingo.

The 229th "Stacked Deck" Battalion, a part of the 11th Air Assault Division [now 1st Cavalry Division (Airmobile)], departed Fort Benning, Ga., on 1 May and loaded aboard the *USS Guadalcanal* at Jacksonville, Fla., for transport to the Dominican Republic.

In all, the task force consisted of about 200 men, 20 UH-1D troop lift helicopters, 1 UH-1D medical evacuation helicopter, 6 UH-1B weapons helicopters armed with XM-16 rocket-machinegun kits, and varied ground vehicles and supplies.

Fifteen miles off the coast of the Dominican Republic, at 0700 four aircraft led by the battalion commander were flown ashore to establish a receiving area at San Isidro near Santo Domingo. En route, the battalion vanguard was unable to establish radio communications with shore units, despite trying all frequencies. Apprehension began to rise as the helicopters proceeded inland without knowing what tactical situations might be encountered. However, the sight of U. S. aircraft at the airfield at San Isidro brightened the picture.

Upon landing, a communications system was set up to bring in the remainder of the aircraft. Meanwhile the task force's ground vehicles were landed on the beach, and despite some sniper fire had rejoined the battalion by 1800.

The four vanguard helicopters had arrived at San Isidro just in time to allow the battalion commander to attend a briefing with commanders of the 82d. The task force was assigned at corps level, and included in the 82d's contingency plans.

Immediate liaison was established with the 82d. The task force commander visited all 82d brigades and battalions to exchange information concerning capabilities. Also, one task force officer was designated to maintain liaison with each brigade and battalion.

Next, the 82d concentrated on a comprehensive training program with the task force to cover loading and unloading of troops, equipment, and supplies; arm and hand signals; and the execution of tactical situations with infantry platoons.

The 229th (Stacked Deck) Helicopter Battalion held a "pat" hand in island operation

In one instance a night "raid" was conducted, using four helicopters and without the aid of air-to-ground radio communications with friendly forces in the objective area. After a map recon, three Hueys flew troops to the objective area.

About 1500 meters from the LZ all lights were extinguished except on the lead aircraft. At the same time the fourth UH-1D (with 48-foot blades) acted as a decoy. All lights were turned on and the helicopter was slowed from 90 to .20 knots to create a loud flapping of the blades. Under cover of this distraction, the other three aircraft picked up flashlight signals from the ground and slipped into the LZ. During landing the flashlights were beamed at the ground and moved ahead of the landing Hueys to light the way.

To accomplish such "raid-type" missions the helicopters must arrive at exactly the right time and from the right direction or the ground signals will not be given —necessitating the abortion of the entire operation. Flashlights on the ground are held to form a funnel pattern—three in the cone and one in the stem. Aircraft approach into the cone.

Flashlights also proved instrumental in the successful evacuation of an ill Dominican farmer. The mercy call came after dark. Despite severe thunderstorm activity, unit pilots flew a UH-1D from Santo Domingo over the mountains by radar to Nagua. There they picked up a Dominican doctor and a special guide to take them to the village of Lamota—10 miles farther north. Landing was made possible by natives holding flashlights. The entire mission covered over 130 miles and was made on instruments in near zero visibility as the pilots took direction finding steers from the radar.

A "pure" air security mission was run when the U. S. Consulate in Santo Domingo was threatened by force and food supplies became short. The 82d was ordered to secure an airfield in Santo Domingo and hold it until U. S. Air Force transports could bring in food.

Operations

Lieutenant Colonel Earl K. Buchan
CO, 229th Assault Helicopter Bn, 1st Cavalry Division

Intensive training paid dividends for the 229th deployed in support of the 82d Airborne Division

Santo Domingo

Using the task force, the 82d launched an airmobile operation on the airfield. After determining the exact moment the first light of day would appear, the helicopters took off into the morning darkness and flew 65 miles at low level. At about 1,000 meters from the LZ the area began to get light. This, plus aircraft landing lights, permitted a successful landing 15 minutes before the C-130s began coming into the secured area.

Professional ability and ingenuity are evident in the mission. They also appeared when an improvised "GCA" was made at sea to the *USS La Salle,* which was equipped with landing platform. The "GCA" took place during a passenger mission to the La Salle which was routine until the pilot ran into IFR conditions.

Since the La Salle did not have instrument landing equipment, the electronics men among her crew improvised with their combat radar.

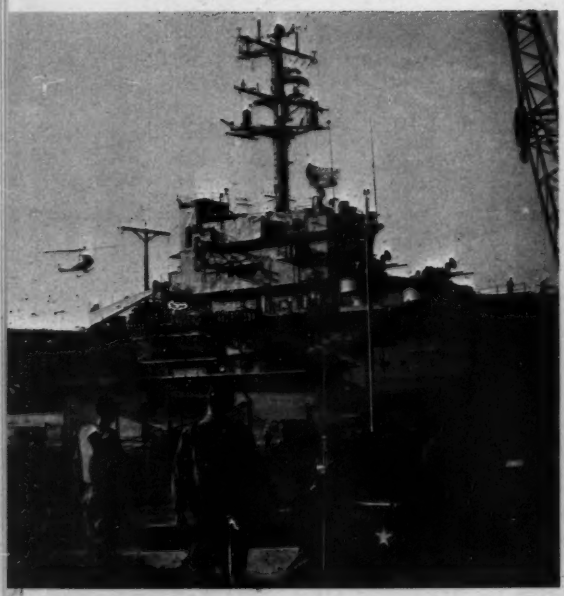
While flying at 100 feet above the waves, and in heavy rains and turbulent winds, the UH-1D was guided to within ⅛ mile of the ship. The pilot then could make out the outline of the LaSalle and landed safely on the rear deck. Later it was learned this was the first IFR approach made to the La Salle.

The Army and Navy teamed up for another "first"—at least for the *USS Miles C. Fox,* a U. S. Navy destroyer. It occurred during the delivery of equipment needed by the Fox, which was operating in heavy seas about 15 miles off the coast of Santo Domingo. The plan was to lower the equipment from the helicopter onto the deck of the ship, which was steaming at 10 knots.

Upon arrival over the destroyer it was noted that a 30-foot square area had been cleared on the aft section of the ship. The aircraft was landed—a first for the Fox—and the Army Aviators received the compliments of the ship's captain for the proficient manner in which the landing was accomplished.

Maintenance was another area in which professionalism paid dividends for the task force.

The "Stacked Deck" battalion took 22 maintenance men from B Company of the 611th Mainte-



Left above: "Stacked Deck" battalion ground vehicles ready to move aboard USS Guadalcanal . . . while Hueys are flown aboard (left) . . . and (below) secured for sea transport to the Dominican Republic

nance Battalion and 15 days back-up supplies to the Dominican Republic. They were equipped with the 11th Air Assault's shop vans (air transportable maintenance kits). These combined with support from the 82d's 2½-ton vans enabled the task force in the 900 hours flown in the first month to hold a 98 percent availability rate for aircraft. Usually 21 and never less than 19 aircraft were available.

The deck may be stacked—but not *against* the 229th.

From 15 miles off the coast Hueys left the carrier for more familiar terra firma (right)... and soon were actively supporting the 82d Airborne Division (below)

HUEY flying sense

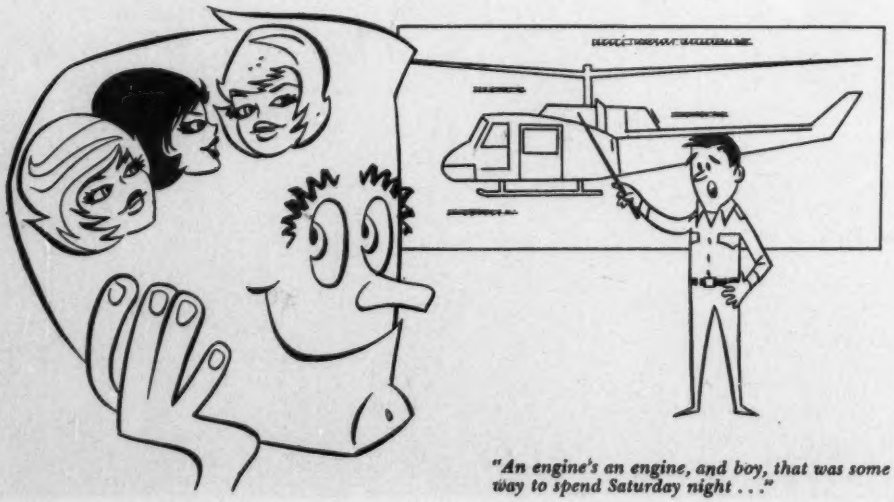
WO Bruce P. Mauldin

Mr. Mauldin is assigned to the Dept of Rotary Wing Training, USAAVNS, Ft Rucker, Ala.

MEET HARRY Hot-Rock, chopper pilot first class. This guy has umpteen thousand hours in everything from Sioux to Choctaws, and just finished the Huey transition course down at Fort Rucker. "Man, what a bunch of bull that was! All that talk about turbines and droopers (or something like that), power lag, and governors. Ho-hum."

His first day in class, the instructor said something about what a fabulous helicopter that bird could be when treated right, but that she could turn on you in a hurry if you gave her too much rope. Old Harry, he had umpteen thousands hours and "Boy, that was some fine chow last night," and zzzzzzzz.

Then they walked out on the flight line. Each student went with his instructor, and soon there were lots of bright faces as experienced teachers



"An engine's an engine, and boy, that was some way to spend Saturday night . . ."

The flying business has an amazing way of eliminating the Harry Hot-Rocks . . . permanently

explained the many differences between the Huey and her reciprocating sisters. Lots of bright faces, except Harry's. "Man, what an insult. That young whippersnapper trying to tell *me,* the world's hottest pilot, what makes an eggbeater go? Ha! Turbine, schmurbine. An engine's an engine, and this one puts a lot of power at your fingertips and boy, that was some way to spend Saturday night," zzzzzzzz.

Time to go fly. "Now I'll show this kid what a waste of time this course is for me. I'll just whip this baby up into a Hot-Rock special, super-duper 360 overhead takeoff, with a crowd-thrilling departure at treetop level, and—hey, man, who closed the throttle?"

Our hero extracts himself from the wreckage, unwinds his rabbit's foot from the console, and departs the scene, stage right—older, wiser, and soon to be poorer, minus that flight pay.

Sound familiar? Sure it does. Perhaps, if you're a safety officer, too darned familiar.

Harry exists in many places. If the place happens to be a quiet safe little airfield on the corner of your post, he may succeed in livening things up. Give the crash crew some practice.

The Harry Hot-Rocks in the Army somehow never really believe that grabbing a whole armload of collective in a heavily loaded Huey doesn't work. They never believe, that is, until they find themselves facing a long row of somber faces across a big table. Our friends at the Lycoming factory have made numerous improvements to their engine, until today we have a whole lot of power and a relatively fast reaction rate. However, deep in the heart of Texas, the boys at Bell have found a way to make the Huey use all that power. Add bigger blades and a bigger cargo area on the same old airframe and, just like magic, you're right back where you started. You gotta use the ol' bean.

F'rinstance, back in flight school, every time you could get away from your instructor, chances are you tried a couple of those landings that ended with a quick flare at the bottom and a fast pitch-pull to stop that big bird right on the spot. Worked fine, didn't it? Well, it won't work so good when you try it while going into a 5,000-foot high pinnacle with 1,500 pounds of rice in the back seat so those little troopers at Hohum, Vietnam, can eat lunch. If you try it, chances are those little guys will have their day ruined in more ways than one. And they don't write off crashes in the LZ as combat losses.

Then there's the Harry who likes to make those nose-low, full-power takeoffs, with a fighter-style cyclic climb at the end of the runway or at 120 knots, whichever occurs first. Try that with an armed Huey at a fairly high density altitude and one of several things will happen:

- Harry will find himself facing the south end of a helicopter heading north, if he hasn't crashed before leaving the pad, or. . .
- Harry will survive the acceleration (the Good Lord willing), and when he puts the cyclic in his stomach, he'll leave that M-6 system bouncing down the runway behind him, or. . .
- He'll survive the whole thing (unlikely hypothesis) and spread his ship thinly all over the runway when he returns and tries to land the same way he took off.

The whole solution to flying the Huey is to take your time, and suppress the urge to prove to yourself and the world that the UH-1B is the greatest thing that ever happened to rotary wing flight. That should be evident to the starch wing boys every time you move out smartly (but slowly) with a cargo hold full of lead blocks, or rice, or people, or what-have-you.

Nobody's impressed by screaming takeoffs and landings except the USABAAR people, and they're plenty impressed at the inevitable outcome of these tactics. If you want to thrill the boys at the home airfield, ask the tower for clearance to do an overhead break from a 15-ship formation. At least the crash crew will have time to warm up its engines.

The flying business has an amazing way of eliminating the Harry Hot-Rocks, permanently. Unfortunately, they usually take innocent people with them. One accident, as a result of Harry's ignorance, should be enough to convince anyone, but if you're Harry, perhaps you'd rather not learn.

A major in Army Aviation once put the solution to happy and successful flying in the Iroquois into a small phrase: DGIH. Don't Get In a Hurry. Words to live by.

Aviation Safety Planning Guide

. . . to help commanders at all echelons to establish an effective aviation safety program

United States Army Board for Aviation Accident Research

THE ESSENTIAL portions of this guide were extracted from Circular Number 385-4, prepared by Lt Col John Hughes, Headquarters, 52d Aviation Battalion, U. S. Army Support Command, APO San Francisco 96295. Its purpose is to help commanders at all echelons to plan and establish an effective aviation safety program.

This guide is not intended as a cure-all for unit commanders' accident woes and weak spots. It is intended only to serve as a guide and to outline the essential tasks and functions needed for a successful safety program.

AVIATION SAFETY OFFICER

The unit safety officer should, when possible, be a senior Army Aviator, qualified in all unit aircraft, instrument rated, and a graduate of the Army Aviation Safety Course. His duties are:

Assist and advise the commander on all matters pertaining to aviation safety.

Plan, organize, conduct, and supervise the aviation safety program.

Review, analyze, and develop directives, regulations, and unit SOPs in support of aviation safety.

Monitor all policies, standards, and procedures relating to aviation safety.

Maintain files, records, graphs, and charts of unit aircraft accidents, incidents, forced landings, precautionary landings, and hazard reports.

Conduct periodic aircraft accident prevention surveys, maintain a file of surveys, and make positive recommendations for correction of discrepancies noted.

Coordinate with operations, maintenance, training, and aeromedical personnel to ensure that aviation safety practices are a part of all aviation activities.

Conduct follow-up actions for all recommendations submitted by aircraft accident investigation boards, aircraft accident prevention councils, and subordinate unit aviation safety officers.

Serve as a consultant to unit aircraft accident investigation boards and flight evaluation boards.

Be a member of the unit aviation safety council and the unit standardization board.

Organize and conduct aviation safety meetings.

Monitor all aviation training activities and perform spot checks of aviation proficiency in coordination with unit standardization personnel.

Establish and maintain a preaccident plan in accordance with DA Pamphlet 95-5.

FLIGHT SURGEON

The flight surgeon (aviation medical officer) assists, advises, and represents the command in the development of an aviation medical program as an essential part of the aviation safety program. He is responsible for the mental and physical well being of aviation personnel. His duties are:

Develop and maintain the unit's aviation medical program.

Participate in and observe flight operations to monitor physical stresses in flight contributing to fatigue, exposure to acceleration and temperature extremes, vertigo, disorientation, psychomotor skills, mental discipline, and emotion.

Serve as a member of the aircraft accident investigation board.

Serve as a member of the flight evaluation board.

Be responsible for adequacy of the medical portion of the aviation preaccident plan.

Remain fully aware of the social and personal habits of aviation personnel.

Maintain aviation medical records of flight personnel.

Monitor the survival and physiological training of aviation crewmembers.

AVIATION SAFETY COUNCIL

The purpose of an aviation safety council is to promote accident prevention from the command level. Each unit having aircraft and aviation personnel should establish an aviation safety council. Meetings should be scheduled periodically (monthly, or more frequently as required) to discuss all matters relating to aviation safety. Membership of the council should include:

Unit commander.
Aviation safety officer.
Operations officer.
Instrument flight examiner.
Maintenance officer.
Flight surgeon.
First sergeant.

Control tower operators, weather advisors, and others as appropriate.

The council should promote aviation safety through the exchange of ideas, discussions, reports of flight hazards or deficiencies, etc. It should resolve all problems through command action. Problems which cannot be resolved at the local level should be passed to the next higher command for necessary action. The council should formulate safety policies and doctrines. It should write ap-

propriate directives and instructions to promote the aviation safety program and it should monitor and review the program.

AVIATION SAFETY MEETINGS

Informal aviation safety meetings should be scheduled periodically (at least one per month) for all aviation personnel. The unit aviation safety officer should establish the time and place for meetings and should plan the meetings to be interesting, entertaining, and informative. These meetings should not be scheduled for any set length of time, nor should they be monopolized by dull speakers or preaching lectures. The subject of each meeting should be provocative, timely, and presented in a way that will encourage maximum audience participation.

AVIATION SAFETY BULLETIN BOARD

Aviation safety bulletin boards should be established in all aviation units, located in areas where they will be seen by flight crews and mechanics. It is recommended, where possible, that one bulletin board be placed in the operations office for aviators and another in the maintenance area for mechanics. The aviation safety officer should use imagination and ingenuity in posting material that will attract attention and promote aviation safety. Posters should be used, but only those posters which have a positive message. Original posters with a single illustration and short message are the most effective. To maintain interest, the material on bulletin boards should be changed frequently.

MONTHLY WEATHER BRIEFING

Each unit should have a monthly weather briefing by a qualified weather forecaster. This briefing should include the weather to be expected for the next month, any anticipated weather hazards, and what aviators should look for to avoid hazards.

NEAR-ACCIDENT FLIGHT-HAZARD REPORTING SYSTEM

The unit aviation safety officer should see that adequate supplies of DA 2696 SHARE-IT forms for reporting near-accidents and flight hazards are placed in convenient locations for all aviation personnel.

MONTHLY AVIATION SAFETY THEMES

The unit aviation safety officer should plan timely subjects to develop and stress for each month. Following is an example:

Jan— Review of SOP, weather flying
Feb— Know your aircraft, flight planning
Mar— Aviation medicine, survival training
Apr— Ground accidents, tactical strip selection and reconnaissance
May— Thunderstorms, landing and takeoff accidents
Jun— Hot weather operations, flight violations
Jul— New pilot checkout, the preflight inspection
Aug— Wire hazards, flight ramp safety
Sep— Instrument flying techniques, flight regulations

Oct— Mountain flying, density altitude
Nov— Flying proficiency, tactical flying
Dec— Flight standardization, maintenance safety

STANDARDIZATION BOARD

A standardization board should be organized for all aviation elements of a unit, with the unit commander as chairman. The board should standardize all procedures pertaining to aircraft operation, including such areas as preflight and cockpit procedures, basic and advanced flight maneuvers, ground operation, instrument flight procedures, radio procedures, etc. Membership should be composed of the most experienced and highly qualified unit aviators. The board should have responsibility for standardizing unit IPs and members of the board should make every effort to fly as often as possible with all unit aviators. Meetings of the standardization board should be held monthly, or as often as required to develop and maintain standardized procedures.

AVIATION SAFETY LITERATURE

The unit aviation safety officer should maintain a reading file of all available aviation safety literature. This material should be placed where it is readily available to all aviation personnel. It should include —10 manuals and standardization guides for each type of aircraft assigned to the unit. Suggested items for the reading file are:

U. S. ARMY AVIATION DIGEST.

WEEKLY SUMMARY of Army aircraft accidents, incidents, and forced landings.

MONTHLY SUMMARY of Army aircraft accidents, incidents, and forced landings with confirmed or suspected maintenance causes.

Accident summaries.

Available aviation safety publications from the other services.

Weather manuals.

PS magazine.

Sense pamphlets.

Flight regulations (DA 95 series).

EQUIPMENT INSPECTION REPORT SYSTEM

The maintenance request (DA Form 2407) is designed to give the greatest amount of maintenance information with minimum effort. The proper preparation, use, and disposition of this form will influence the operational ability of the unit and its equipment. Accuracy and proper distribution of completed copies on a timely basis are required. Instructions for preparation and distribution are found in TM 38-750. Maintenance requests will be used to submit separate equipment inspection reports, equipment failures, defective new manuals received (other than those damaged in shipment), or to propose improvements in materiel or maintenance procedures. EIRs may be originated by anyone using Army equipment or materiel. EIRs will be submitted when design deficiencies or abnormal conditions result in:

Conditions hazardous to personnel or equipment.

Unsatisfactory operation or performance of equipment.

Faulty material or poor workmanship.

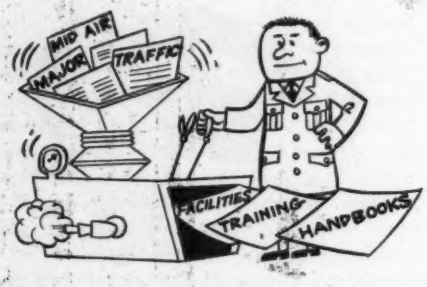
Abnormal wear or deterioration.

Excessive maintenance effort.

ENLISTED AVIATION SAFETY COUNCIL

To benefit from the great amount of experience to be found in enlisted ranks, and to integrate all members of the command into the aviation safety program, an enlisted aviation safety council should be formed in each unit.

The council should be composed of the most experienced and qualified NCOs within the unit with the first sergeant or chief maintenance NCO as chairman. This council should meet regularly to discuss elements of the aviation safety program related to their areas of operation (ground handling, refueling, ammunition handling, maintenance procedures, etc.). The council should attempt to correct known discrepancies and should report all discrepancies, whether corrected or not, to the unit aviation safety officer.



AIRCRAFT ACCIDENT PREVENTION SURVEY

The Aircraft Accident Prevention Survey is designed to isolate potential aviation hazards in facilities, equipment, and personnel.

The commander, through his staff, must be kept informed of the progress of his accident prevention program. This aircraft accident prevention survey is one of the best methods for monitoring a unit's prevention program.

Though an accident prevention survey must consider all functions which directly or indirectly affect operations, breaking it down so that each function is reviewed separately will greatly facilitate evaluation of a unit's operations.

To be effective, an aviation accident prevention survey should be a revolving project and those conducting the survey should be thoroughly familiar with staff procedures so that recommendations may be directed to the proper staff member or appropriate agency. One survey would only disclose the potential problem areas of the moment and would not provide any assurance that corrective action would be taken. Followup surveys should be conducted to assure that corrective action was taken on recommendations made as the result of previous survey; that no new potential problem areas have developed since the last survey; or that potential problem areas which were overlooked before or which were considered relatively unimportant at the time may be brought into proper perspective.

Just how detailed and how often the survey should be made will vary in individual cases. Answers to these questions will be regulated by the effectiveness of a particular accident prevention program. Some commanders may decide a particular phase of the survey should be made more often than others. Another commander will find that many items do not apply to his unit, e.g., the section on instrument approaches when the commander has no instrument approaches available.

The aircraft accident prevention survey is not intended as a cure-all for an aviation unit commander's accident woes and weak spots. The question and answer checklist is meant merely to serve as a guide for the commander and to awaken him to an awareness of potential problem areas within his unit. If the survey is used with this in mind, it will serve materially as a foundation upon which to build an effective accident prevention program.

SPECIAL MESSAGE FROM UNIT COMMANDER

To all unit aviators:

In addition to the other parts of our aviation safety program in which you play a direct role, I ask that you direct your special attention to:

Preflight yourself and your aircraft before every flight.

Read every book, magazine, paper, manual, or any other type of material you can get your hands on that has to do with aviation.

Maintain a healthy curiosity. If you don't know the answers, ask questions until you find someone who does.

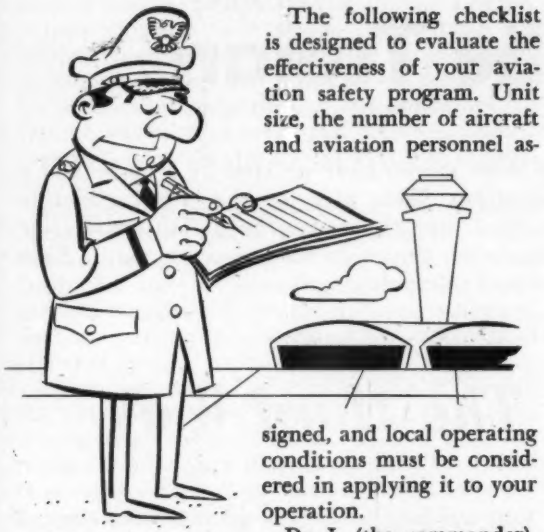
Flying ability is a great deal like muscles. Use them—exercise them often—and they grow stronger. Let them loaf and they become flabby and uncertain. Every flight, whether training, service, or administrative, offers some opportunity for you to build greater proficiency. I urge you to take full advantage of this fact.

Do not let a false sense of accomplishment or pride cause you to exceed the limits of your proficiency or your equipment. Remember, regardless of who your passengers may be, the pilot in command is responsible for the safe conduct of the flight. Stand behind your decision!

Personal problems have no place in Army aircraft. Solve your problems before you fly, or stay on the ground.

Maintain your physical health through proper diet, adequate rest, and daily exercise.

COMMANDER'S AVIATION SAFETY CHECKLIST



The following checklist is designed to evaluate the effectiveness of your aviation safety program. Unit size, the number of aircraft and aviation personnel assigned, and local operating conditions must be considered in applying it to your operation.

Do I (the commander) have an established aviation safety program?

Is my aviation safety officer thoroughly qualified?

If aviation safety is assigned as an additional duty, does he have the time required to establish and monitor the program?

Does he have ready access to me?

Do I examine and endorse his programs and recommendations?

Is he qualified in all unit aircraft and does he actively engage in all our flying activities?

Does he carefully study local flight regulations, policies, and operating procedures pertaining to traffic handling, traffic pattern, formation flying, transition flying, refresher flying, instrument proficiency, etc., to ensure that they are consistent with safe standards?

Does he periodically inspect, make suggestions, and follow up training programs to ensure that pilots and crew are being progressively qualified to operate the aircraft assigned with maximum safety?

Does he attend briefings and critiques for flight missions to ensure that they are adequate and fully cover the mission to be performed?

Does he make frequent visits to and inspections of flying and maintenance activities of the base?

Do we periodically review and update our aviation safety program?

Are recommendations offered and acted upon?

Do we complete aircraft accident prevention surveys as required?

Are copies of these surveys available for study by all related organizations?

Do we keep records of the deficiencies disclosed during the surveys and of the corrective action taken?

Do we monitor all EIRs submitted by the unit?

Do we have an adequate, effective preaccident plan?

Is a current record maintained of all unit accidents and incidents?

Is prompt and effective preventive action developed from local accidents and incidents?

Do I follow up on recommendations made in aircraft accident reports?

Do we make analytical studies of all local accidents and of other accidents in the same type aircraft to determine trends and cause factors and to anticipate future trends?

Do we eliminate these cause factors?

Does the aviation safety officer maintain a reference file of flight safety publications?

Are records of all reported violations of regulations, including action taken, available to the aviation safety officer and to me?

Does the aviation safety officer maintain close liaison with the operations officer?

Does the aviation safety officer cooperate with and exchange ideas with Army safety directors, USABAAR, and other aviation safety officers?

Are USABAAR publications received and distributed?

Are aviation safety bulletin boards fully used?

Do I comment on my awareness of publications and bulletin boards?

Are the bulletin boards conspicuous, neat, and current?

Are aviation safety meetings held periodically?

Are the meetings interesting and pertinent?

Is audience participation encouraged at aviation safety meetings?

Do all aviation personnel attend?

Do I participate actively in aviation safety meetings?

Do my operations officers, flight surgeons, and maintenance officers participate?

Do we have a near-accident and flight-hazard reporting program in effect?

Is local corrective action taken on these reports?

Copies of this guide in a convenient format may be obtained by writing to Director, USABAAR, Fort Rucker, Alabama 36362. Direct communication authorized by AR 15-76.

Tales From The Trojan

The following three stories were written by members of a recent Communications Skills class of the Army Aviation Safety Course at the University of Southern California. The authors, understandably, prefer to remain anonymous. Each contains an important safety message.

Partial Panel . . . The Hard Way

THE RINGING wouldn't stop. I stood in a long line trying to cash in the winning ticket on the last race. But it was only the telephone that kept me from being the richest flying lieutenant in the area. I stumbled across the room, cursing the joker who would call at such an ungodly hour.

"Go ahead. It's your nickel."

"Very funny, lieutenant. Do you know what time and day this is?"

"Yes sir! It's 0530 Saturday morning. It's my weekend off. I just got back from a party a couple of hours ago. What's up?"

"As of right now, you're back on duty. Take the Beaver and drop off an inspection team at Endsville. Be ready for takeoff at 0800."

"But sir, this is my weekend off! I've got a date and . . ."

"That's too bad! The flight is set up and you're going! I'll send another pilot along to spell you. That way both of you can get some rest. Forecast weather is OK until about 1600. If you don't waste time, you can make it back in plenty of time for that date of yours."

It never helped much to gripe to the old man. He just didn't buy it. I rummaged around the kitchen and tried to get some breakfast together. Still thoroughly disgusted, I drove by my date's house. She wasn't up, so I left a note saying that I might be late because of an emergency flight.

Jerry was standing at the counter in operations. He had already filled out the flight plan and preflighted the airplane. We waited for the passengers to arrive and discussed the flight plan.

"The old man said you sounded sorta rough over the phone. I'll fly the first leg while you rest. There's a little weather en route, so I filed IFR. It's a good chance to practice all that good stuff I learned in instrument school. I'll keep you out of

crash sense

PREPARED BY THE U. S. ARMY BOARD FOR AVIATION ACCIDENT RESEARCH

trouble and show you how to fly the gauges."

We received our clearance to Endsville. Seven thousand all the way. The Beaver never ran any smoother. Our ETAs were close and we penetrated the ADIZ without any trouble. Thirty miles out, Endsville had us on their surveillance radar and asked if we'd like a GCA. Why not? It might be fun.

Jerry slipped a hood over my baseball cap and left just enough room for me to see the ground out of the corner of my eye. When he was certain that I was all set up for vertigo, he told Endsville GCA that we wanted a gyros-out run. Then he reached over and caged the directional gyro and artificial horizon.

My approach was something less than perfect. I could just barely stay in the sky, much less follow the instructions. Everyone on the ground had a big laugh. But since we were from the outside world and had thoughtfully brought the latest editions of the Sears catalog, we were treated like allies instead of a sister service.

There was trouble in refueling. No 80/87—just 115/145. No sweat on filling out a request form. They spill more than we use in a day each time they refuel a KC-97. Time dragged on while we hunted desperately for an adapter small enough to fit the Beaver's filler necks. Finally, a CO_2 fire extinguisher nozzle was used to cut down the waste.

Back at Homeplate, the weather was deteriorating. It was still VFR, but there was freezing rain forecast in 3 hours. Hurry. File out and get out of here. Hurry, the date is waiting. Rather than waste time, we filed out VFR. Besides, it was too bad to go IFR.

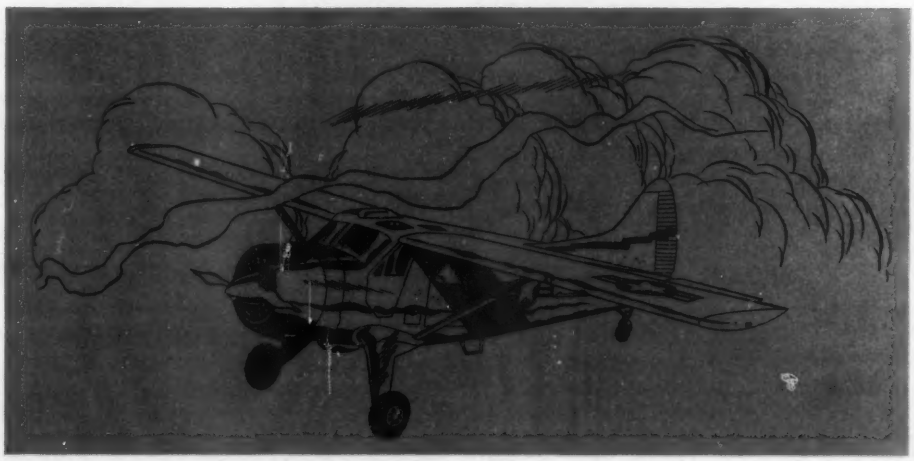
It took a lot longer to penetrate the ADIZ than we had anticipated. A quick check with the E-6B showed that our ETE to Homeplate was closer to 4 hours than the 3 that we had planned. Winds were stronger than the forecaster had promised. The weather was getting worse. The clouds below had been widely scattered. Now they were almost solid. Just enough holes left to qualify as "VFR." Then we were VFR-on-top.

I turned up the volume of the VOR to get the latest weather broadcast. Damn—just missed it! No use to bother FAA en route radio. Might as well wait until the next weather broadcast and make a position report at the same time. Just 30 minutes and 40 miles later, we heard a chilling sequence report. Homeplate was now below minimums and reporting freezing rain. Endsville weather had gone down to 1/2 mile in heavy fog. We couldn't go ahead and we couldn't go back.

Jerry got on the radio and called Halfway AFB approach control. He explained our problem and asked for an approach to Halfway. They listened sympathetically and cleared us for a straight-in VOR approach through the thickening overcast.

"Army 1717, be advised that the ceiling is lowering rapidly. Present Halfway weather 500 and one. GCA is out but is expected to be back in operation in about 30 minutes. Weather advises that you will pick up light to moderate rime ice in your descent through the clouds. Special missed approach procedure: climb to 2500 feet, reverse course and climb to VFR-on-top. Hold on the 140° radial of the Halfway VOR."

We started our approach. As we approached the VOR inbound we went into the clouds. Light rime ice was forming on the wing and strut. No sweat though, the clouds were only supposed to be 1,000 feet thick.



"Army 1717, execute missed approach! I say again, execute missed approach!" Jerry rammed the throttle forward and in a couple of minutes we were back on top, holding at 4,000 in the pattern.

"Army 1717, we just went below VOR minimums. GCA is expected to be operational shortly. Hold on the 140° radial. Maintain 4,000. Request fuel status."

A hurried glance at the bouncing gauges and some quick calculations gave us an estimate of 2½ hours fuel remaining. Jerry reported this to Halfway approach and told me to fly while he took a break. I wandered around the sky and soon noticed other aircraft holding above us. The next weather broadcast confirmed our suspicions. Halfway AFB was the only airport within 300 miles that was above GCA minimums.

An hour later, GCA still wasn't in operation. The clouds had thickened more. We were no longer VFR-on-top at 4,000 . . . more like in-and-out. I was a "blue-ticket" holder and cringed each time we hit a cloud. Another half hour went by before GCA came on the air. They finally gave us instructions to leave the VOR and start our "run." Jerry took over while I nervously watched the carb heat and alternately glanced at the ice building up on the wing.

The first part of the GCA was a piece of cake. The "first team" was in action down on the ground. We were turned over to a honey-voiced final controller. He sounded real confident. His continuous chatter was calm and soothing.

". . . do not acknowledge any further transmissions. You are 7 miles from touchdown. Begin your descent."

Somehow the Beaver seemed to be turning! I thought I probably had another case of vertigo like I had earlier. I concentrated on trying to see

out the windshield to spot the runway in order to help the transition from IFR to VFR upon breaking free from the clouds. Jerry was yelling! Beads of sweat stood out all over his face and hands! I glanced at the instruments. The directional gyro was turning faster and faster! The artificial horizon was rolling over and over!

"Army 1717, turn right 20°. High on glide path, increase your rate of descent . . . Turn further right, 30°. Going below glide path, reduce your rate of descent . . . Still going below glide path, reduce your rate of descent . . . Turn further right . . . Execute missed approach! Pull up! EXECUTE MISSED APPROACH!"

Just then we broke (fell) out of the clouds about a mile from the end of the runway and about a half a mile to the left. I grabbed the wheel and racked the Beaver over to the right! Hard! I wasn't about to get back into those clouds. Jerry found the mike and told GCA we had broken out and were continuing on in "VFR" for landing.

The tower added a few cryptic comments and cleared us for landing. As we rolled to a stop on the ramp, we were met by the operations officer.

"What happened on the approach? Vertigo?"

"No! The DG and artificial horizon went out about halfway down!"

He called the transient alert maintenance personnel to check out the system and fix our trouble. Later, they told us there was some moisture in the lines. Probably it had condensed, settled and frozen, reducing the suction. The low vacuum and odd attitudes probably caused the gyros to tumble.

They dried out the lines and replaced our instruments. Army Beaver 1717 was all set to go, but the weather stayed bad for three days. I was real late for my date, but she waited for me. Matter of fact, eight months later we were married.

I started losing altitude rapidly and shallowed my turn

To Turn Or Not To Turn

I AWOKE SUDDENLY as if something strange were happening. I looked at my alarm and realized the year of 1965 was only 5½ hours old. It was almost time for the alarm so I pushed in the button and started dressing.

After a quick breakfast, I left for the airfield. It was an unusual drive this morning. The air was unseasonably cold and the streets were covered with ice and snow. I could tell it was overcast because no stars were shining.

I walked into operations, stopping by the snack bar to get a hot cup of coffee. I spoke to the still drowsy operations sergeant and airdrome officer of

the day, picked up the phone and called weather. The initial briefing sounded good. I finished my coffee, put on my flight jacket and left to preflight my airplane.

The crewchief had the hangar lights on and the U-8D's engine cowlings up. He put down his coffee, picked up his flashlight and helped me with the preflight. Everything checked out. I told him to have it on the hotspot at 0730 and left.

Back in operations, I started the flight plan. Just as I was completing it, my copilot, I'll call him Colonel S., arrived. He was a master Army Aviator with lots of experience in the U-8. In fact, lots of experience in about everything.

I dialed weather and gave the forecaster the data from my 175 and requested weather for my destination. Colonel S. picked up the extension and listened as I recorded the weather on the 175. As I remember, the weather at my destination was 3,000 broken, 12,000 overcast, with a visibility of 5 miles. En route weather at 8,000 was forecast to be between layers with broken clouds below, with top at 6,000 and an overcast at 12,000 feet above, light to moderate turbulence over the eastern Cascades, and a trace of rime icing in the clouds; wind, 235°/35 knots, temperature –15°.

"How will the local weather be when I return approximately 8 hours from now?" I asked.

"It should be good. We're due a frontal passage in about 3 hours and you should have no trouble getting back in."

Colonel S. said, "It looks like I'll miss the Rose Bowl."

The dispatcher filed our flight plan and the crewchief helped our lone passenger load the 250 pounds of cargo and baggage. Colonel S. and myself rechecked the route and weather while we had that final cup of coffee. Things looked good.

We loaded up and I taxied out to the runway. I thought to myself, I hope the runway isn't this slick. Colonel S. copied our clearance while I ran up. I checked the clearance. It was as requested. The tower cleared me for takeoff. I taxied into position and cautiously applied the power. The runway was covered with ice and slush. The wind was blowing hard, about 15 knots, straight down the runway.

I took off without any problem. At 10,000 feet I asked Colonel S. to recycle the gear in case we picked up a lot of slush on takeoff.

We crossed the first fix and turned southwest on course. Colonel S., with his calm glance, checked the passenger, swept once through the cockpit, and picked up the morning paper beside him.

It took a lot of crab to keep my needle centered, but both omnis showed me to be on course. It had been turbulent since takeoff, but now I was having a little trouble holding altitude due to vertical currents.

Ten minutes out from the first fix, center called and said, "You can figure your groundspeed at 120 knots." Colonel S. laid down his paper. He picked up the computer and gave center a revised estimate. I commented, "That's a lot of wind."

"Yep."

"It's also getting dark ahead."

"Yep," and back to his paper.

We entered the top layer of clouds about the the time we reached the eastern Cascades. The windshield immediately iced over and I glanced out at the wings. They were building up also. I immediately went back to the gauges. I was loosing altitude and airspeed. I increased rpm and power. I noticed that Colonel S. had discarded his paper and was checking the ice buildup on the free air temperature gauge. The altitude remained stable but I was still losing airspeed.

Colonel S. said, "It looks clear to me."

I understood what he meant when I looked at the wings—clear ice. I was glad I had turned on the propeller anti-ice system before entering the clouds. We cycled the deicing boots and the ice on the wings broke off.

By this time I was carrying meto power and indicating 120 knots.

He asked, "Can we climb?"

I pulled back on the yoke. The aircraft answered his question with three sharp buffets. The boots were kicking the ice off but it was sticking everywhere else.

We notified center of the condition and requested a descent to 8,000 feet. Unable to maintain altitude there, we descended to 7,000, 6,000, and wound up at 5,100 feet, the MEA. I could barely keep the old bird level, but we were maintaining altitude—that is, until I got a good downdraft and lost another 200 feet. Luck was with me, because I gained 400 feet on the up side.

A thought flashed through my mind, "What would happen if I lost an engine?" I immediately changed my trend of thought and started planning. We had only 50 miles to go before the MEA went up to 9,000 feet. The free air temperature read –3°. Ice would not melt off at that temperature. What now?

I said, "Colonel S., call center and request clearance. I'm going back home."

Colonel S. smiled and said, "I'm with you."

When I rolled into a standard rate turn to the right, I got the full realization of how heavy the airplane was. I started losing altitude rapidly and shallowed my turn.

We staggered back toward home, still in and out of the soup. It was snow by this time and it was apparent that the frontal system was moving in. We breathed a sigh of relief as RAPCON let us down to 3,000 feet and the Seminole started getting light again.

Just then, we received a weather advisory stating that the surface winds back home were blowing at 25 knots, with gusts to 40 knots. This accounted for the moderate bounces we were getting. Home weather was 2,000 broken, 5 miles visibility, winds 180° at 25 knots, with gusts to 40 knots. The controller commented they were getting peak gusts to 60 knots.

All I can remember about the GCA to RW 14 was that it was awful bumpy and it took a lot of power changes to stay on the glide slope. The ice flaked off the windshield on base leg. I will not describe the landing except that I am proud of it. The flight wasn't over yet. I was having trouble maintaining directional control on the icy runway with the strong crosswind. By jockeying the engines back and forth, I stayed on the runway. As I set the parking brake in front of operations, I wondered, Where would I be now if I hadn't done that 180° turn?

No Thanks . . . We'll Have Enough

It should have been a routine flight. Both the copilot and I had flown the route on many occasions. We could quote frequencies, altitudes, headings, and ETE for any leg. The mission was simple—drop two passengers at Green AAF and return to home base. It was noon as we taxied the U-8 to the ramp in front of Green Operations.

"Nice flight," complimented one of the passengers.

I agreed. It had been perfect. For once the forecaster had hit the en route weather right on the head—quite an accomplishment when forecasting in the Rockies. It was as though he had flown the route just before our briefing. The solid deck of clouds with tops at 12,000 feet that he had forecast required an hour and 45 minutes at 15,500 feet, with oxygen, to maintain VFR. It had been clear and 60 before and after passing the overcast. As I left the cockpit, I glanced at the oxygen console. We had 900 pounds remaining.

"Top her off all the way across, three point five on the oil, and replenish the oxygen," yelled the copilot to the alert man as we walked toward operations.

After a hurried sandwich and cup of coffee, we returned to operations to file. The flight back would be a retrace of our route that morning. The copilot completed the 175 from memory, without referring to the Jepp chart. Checking with weather, we asked for a final briefing VFR to home base.

"You should find, generally, the same conditions that existed along the route this morning," the forecaster said. "No ceiling en route until you reach the Granite area. From there, extending 175-200 nm along your flight path, you'll have that solid stratus layer. Heating will have produced widely scattered buildups within the layer, tops to 25,000 feet. You should top the stratus out at about 15,000 feet. You'll encounter light to occasional rime ice in the clouds. On top is your only chance VFR, since there are some 500 feet and 1 mile conditions underneath. Have you considered IFR?" he concluded.

"Yes, but because of the high MEAs throughout most of the route and to avoid the possibility of ice, I think we'll plan VFR," I replied.

"Sounds reasonable," he said as he penciled in our 175 weather.

"Ship's all ready to go, sir," said the operations sergeant as I handed him our flight plan, "except

for your oxygen request. We dispensed our last bottle this morning. The supply truck is due in an hour or so if you'd care to wait."

"No thanks," I replied. "We'll have enough."

Or would we? I thought as I walked toward the U-8.

Quickly reviewing the situation, I decided there would be ample oxygen if we could maintain obstruction clearance altitude until reaching Granite.

"What do you think?" I asked the copilot. "Have we got enough?"

"We should have," he replied. "With scattered condition practically all the way to Granite, we can maintain an altitude of about 10,000 feet to that point. I figure the longest we'll require oxygen will be about the same as this morning. After that it should be clear sailing."

I agreed, if conditions were as reported.

At 10,500 feet I adjusted power and props for cruise. The country below moved slowly beneath us, interrupted occasionally by puffy cumulus clouds. This was the life, I mused, knocking the ashes from my pipe.

An hour passed. Gradually, the cloud condition changed. Broken to overcast stratus replaced the cumulus puffs. Towering cumulus buildups rose to meet us. In another few miles a climb to a higher altitude would be necessary to continue VFR. A check of our flight log placed us 54 minutes short of Granite.

Going on oxygen this early could mean cutting our supply uncomfortably close, I thought, as I climbed to 12,500 feet. To conserve our supply I told the copilot we would not use it until we were forced to climb again.

Another climb was not long in coming. Fifteen minutes later I had climb power applied and on the way to 14,500 feet. As I leveled off the copilot handed me a mask.

"Breathe easy," he said. "We may need all we have!"

Our concern for oxygen faded at this point. More important matters required our attention. It soon became impossible to duck the buildups rising out of the stratus layer and stay anywhere near the airway. I pulled the nose up, applied power, and climbed to 16,500 feet. The copilot was computing a change to IFR from over Granite.

Over Granite omni our problems seemed at an end. The top of the stratus stabilized at 15,000 feet. Looking ahead it appeared that 16,500 feet would keep us VFR. An airline pilot had reported moderate rime icing at 13,000 feet, 50 miles west of Granite. We decided to remain on top. The proposed change to IFR was never requested.

Fifteen minutes out of Granite I began the old ducking game again. The cumulus buildups became higher and more numerous. Minutes later the stratus began licking at our belly.

I began a slow climb to a higher altitude. Although the altimeter showed a slow, steady increase we were just able to stay above the cloud layer. The altimeter passed through 19,000 feet. Still, the clouds filled our wheel wells. I glanced at the omni. It indicated a full needle deflection off the airway. I turned 20° into the needle.

Minutes dragged by. We were in and out of the clouds now and, with full power, just able to maintain a climb. A climb of more than 200 feet per minute activated the stall warning. I lost the 20° correction to return to course. Back into the needle I turned.

The altimeter passed through 22,000 feet and still climbing.

"Will we ever find the top of this stuff?" I asked aloud.

"Set up Victor 14 on the number 2 omni," I said into the mike. "When we intercept I'm going to continue across and begin a descent as soon as we're off the airway. Turn up the volume. Let's see what the weather is out there."

Victor 14 ran generally north and south. Beyond the airway lay the plains. There would be no peaks there and we could descend to about 7,000 feet. My thoughts were interrupted by the weather broadcast. The omni serving Victor 14 was reporting 5,000 overcast and 10 miles. I felt relieved. We were now at 24,000 feet and not entirely VFR. Suddenly the number 2 omni began to move toward center. I dropped down 500 feet to cross the airway.

I watched the needle center and move toward the opposite side of the indicator. And then, suddenly, I remembered—the oxygen! As my neck strained to look up and back toward the console my eyes met the indicator. What I saw would ruin a day in the life of any aviator. The needle was pegged against the empty mark. I grabbed my flow tube and pinched it as if this would help. The red plunger was completely exposed. Our oxygen bottle was empty!

The descent that followed was hasty and somewhat uncontrolled. We broke out at 11,000 feet. As we continued the descent to a lower altitude my peripheral vision began to improve and the blueness faded from my lips. Panic soon gave way to reality and reason. Realization of what had happened and what easily *could* have happened came fast. **I remembered the operations sergeant asking if we'd like to wait for the oxygen truck and my answer, "No thanks. We'll have enough!"**

Help Wanted

ALONG THE banquet circuit an "expert" is defined as a knowledgeable man from out of town. Well, we need experts! Incisive, knowledgeable, cogitating pencilpushers. Someone to lean back and fire off authoritative dispatches about what is going on in Army Aviation. We need YOU—the aviator, enlisted man, civilian.

You have seen Army Aviation in action throughout the world—in airmobility operations, topographic work, rescue, liaison, transportation, supply, enemy action. What new application was made of Army Aviation? Did you use it in a new way or in a variation of established practices?

You can tell the rest of Army Aviation how the job or mission was done more efficiently, effectively, economically. *You* were there. What happened on your last ATT or FTX? Anything unusual about the maintenance, logistical, or tactical use of Army Aviation? Give us a firsthand account.

Sure, sooner or later everybody may learn about those solutions. But why later? Send it to the DIGEST and they will learn it sooner. We need grassroot support to publish meaningful material that will contribute to the mission of Army Aviation.

Many safety practices are not written in operators' handbooks, SOPs, etc. By passing the word along on how *you* prevented an accident or turned a potential one into an incident, we can get the information into the hands of the people who need it and will be helped by it right away.

Expert writing ability is not the most important thing; we are concerned that *your* knowledge be projected through the DIGEST. Write us in longhand. We are expert decipherers. We want facts, not fancy words. Don't worry about spelling or messy typing or length. We have the latest edition of Webster's, and our typists and editors are good.

What we don't have is *your* firsthand, current knowledge of what is going on in the field. Anonymity will be honored if requested. We would like your original draft or cover letter to bear your signature in case questions arise or more information is needed.

It's your magazine—and something new has been added! Beginning with the July issue, an engraved bronze plaque will be presented the author of the best article of the month as a recognition of achievement. And remember, monthly winners become eligible for a cash prize of $125, $75, or $50 awarded for the three best articles of the year.

While the plaque is something to be proud of, and the money is something you can use, the important thing is that your experiences, safety knowledge, and good practices may prevent an accident and save someone's life—*if you give him a chance to read about them.*

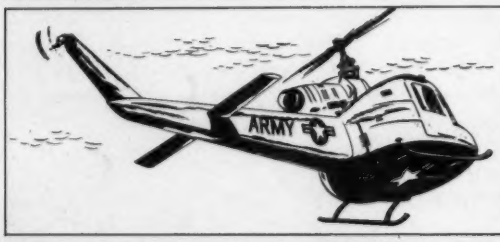
We will be looking for your idea in tomorrow's mail. It may not win a plaque or a cash award. *But it could save a life!*

VIP FLIGHT

PREPARED BY
THE U. S. ARMY
BOARD FOR AVIATION
ACCIDENT RESEARCH

THE MISSION CALLED FOR VIP TRANSPORTATION FROM POINT "A" TO POINT "B" THE FOLLOWING MORNING. BOTH POINTS WERE SOME DISTANCE FROM THE UNIT AIRFIELD. LOW CEILINGS, FOG, AND REDUCED VISIBILITY WERE FORECAST. FEARING THE FORECAST WEATHER MIGHT DELAY THE VIP, THE UNIT DISPATCHED A U-8 TO POINT "C" THAT NIGHT TO BE READY FOR A MORNING IFR FLIGHT. THE UNIT COMMANDER SCHEDULED HIMSELF AS PILOT OF A UH-1 TO FLY TO POINT "A" EARLY THE NEXT MORNING TO CARRY THE VIP FROM POINT "A" TO POINT "C" WHERE HE WOULD BOARD THE U-8 FOR THE FLIGHT TO POINT "B".

THE UNIT COMMANDER ARRIVED AT THE AIRFIELD AT 0600 HOURS THE DAY OF THE FLIGHT, GOT A WEATHER BRIEFING WHICH CONFIRMED THE FORECAST OF THE NIGHT BEFORE, AND CANCELLED THE UH-1 FLIGHT. HE RESCHEDULED THE FLIGHT 15 MINUTES LATER, STATED HE WAS GOING TO CHECK EN ROUTE WEATHER, AND FILED VFR.



HE TOOK OFF AND FLEW VFR TO AN INTERMEDIATE AIRFIELD. THERE, HE CALLED FOR AN IFR APPROACH BECAUSE OF LOW VISIBILITY IN HAZE, SMOKE, AND FOG. HE LANDED TO REFUEL AND CHECK THE WEATHER. IT WAS THE SAME AS HE WAS GIVEN BEFORE. PORTIONS OF HIS ROUTE WERE FORECAST TO BE ZERO-ZERO IN THE HILLS AHEAD. HE COULD GO AROUND IT BY STAYING IN THE VALLEY, BUT THIS WOULD TAKE LONGER AND MIGHT MAKE HIM LATE. HE TOOK OFF AND FOLLOWED A DIVIDED HIGHWAY TOWARD POINT "A" *AND THE RISING TERRAIN.* THE CLEARANCE BETWEEN THE CEILING AND GROUND CLOSED, VISIBILITY DROPPED AND HE MADE A 180° TURN. HE THEN THOUGHT HE SAW A LIGHTER AREA AND TURNED BACK TO HIS ORIGINAL HEADING. HE FLEW INTO A THICK CLOUD LAYER, LOST SIGHT OF THE GROUND, AND STARTED TO CLIMB.

SECONDS LATER, THE AIRCRAFT CRASHED INTO TREES 50 FEET BELOW THE TOP OF A HILL. THE COPILOT, STILL ATTACHED TO HIS SEAT, WAS THROWN VIOLENTLY FROM THE AIRCRAFT AS IT STRUCK THE TREES AND BEFORE IT REACHED THE GROUND. HE SUSTAINED SERIOUS INJURIES, BUT SURVIVED. THE UNIT COMMANDER WAS KILLED.

THIS PILOT WAS A MASTER ARMY AVIATOR AND HIS COPILOT WAS A SENIOR ARMY AVIATOR. BETWEEN THEM, THEY HAD MORE THAN 10,000 HOURS AND 30 YEARS OF FLYING EXPERIENCE. THE COPILOT HELD SPECIAL FIXED WING AND ROTARY WING INSTRUMENT CERTIFICATES. THE PILOT HELD SPECIAL FIXED WING AND STANDARD ROTARY WING INSTRUMENT CERTIFICATES. ALL OF THIS EXPERIENCE, THE EN ROUTE WEATHER FORECAST, AND THEIR OWN FIRSTHAND OBSERVATION OF THE ZERO-ZERO WEATHER AHEAD WERE PUSHED ASIDE BY THE DESIRE TO GET THROUGH AND COMPLETE THE VIP FLIGHT...
TO SAVE THE VIP THE INCONVENIENCE OF A 30 MINUTE SEDAN RIDE!